

N O T I C E

THIS DOCUMENT HAS BEEN REPRODUCED FROM
MICROFICHE. ALTHOUGH IT IS RECOGNIZED THAT
CERTAIN PORTIONS ARE ILLEGIBLE, IT IS BEING RELEASED
IN THE INTEREST OF MAKING AVAILABLE AS MUCH
INFORMATION AS POSSIBLE

NASA CR-159825

BAT Report No. D2536-941004

(NASA-CR-159825) NASTRAN LEVEL 16
PROGRAMMER'S MANUAL UPDATES FOR AEROELASTIC
ANALYSIS OF BLADED DISCS (Textron Bell
Aerospace Co., Buffalo, N. Y.) 88 p
HC A05/MF A01

N81-19482

CSCL 20K G3/39

Unclas
18073

**NASTRAN LEVEL 16 PROGRAMMER'S MANUAL UPDATES
FOR AEROELASTIC ANALYSIS OF BLADED DISCS**

by

**A. M. GALLO
B. DALE**

**BELL AEROSPACE TEXTRON
P. O. BOX 1
Buffalo, New York 14240**

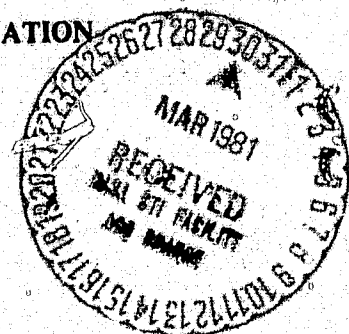


NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONTRACT NAS3-20382

**NASA LEWIS RESEARCH CENTER
CLEVELAND, OHIO**

MARCH 1980



NASA CR 159825

BAT Report No. D2536-941004

**NASTRAN LEVEL 16 PROGRAMMER'S MANUAL UPDATES
FOR AEROELASTIC ANALYSIS OF BLADED DISCS**

by

**A. M. GALLO
B. DALE**

**BELL AEROSPACE TEXTRON
P. O. BOX 1
Buffalo, New York 14240**

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONTRACT NAS3-20382

**NASA LEWIS RESEARCH CENTER
CLEVELAND, OHIO**

MARCH 1980

INTRODUCTION

A computer program based on state-of-the-art compressor and structural technologies applied to bladed shrouded discs has been developed and made operational in NASTRAN Level 16.

The problems encompassed include aeroelastic analyses, modes and flutter.

The program is documented in the form of five NASA Contractor's Reports — one Technical Report and four Updates to NASTRAN Level 16 Theoretical, User's, Programmer's and Demonstration manuals. This report describes the Programmer's manual updates.

PROGRAMMER'S MANUAL UPDATES

APPENDIX 1-b PROGRAMMER'S MANUAL SUPPLEMENT

TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Page No.</u> |
|--|-----------------|
| 2.3.83 Data Blocks Output From Module GPFDR..... | 2.3-290 |
| 2.3.84 Data Blocks Output From Module CYCT1..... | 2.3-292 |
| 2.3.85 Data Blocks Output From Module CYCT2..... | 2.3-293 |
| 2.3.86 Data Blocks Output From Module ALG..... | 2.3-295 |
| 2.3.87 Data Blocks Output From Module APDB..... | 2.3-296 |
| 2.4 EXECUTIVE TABLE DESCRIPTIONS..... | 2.4-1 |
| 2.4.1 Executive Tables Which are Permanently Core Resident..... | 2.4-2 |
| 2.4.2 Executive Tables Not Permanently Core Resident..... | 2.4-16 |
| 2.5 MISCELLANEOUS TABLE DESCRIPTIONS..... | 2.5-1 |
| 2.5.1 Miscellaneous Tables Which are Permanently Core Resident..... | 2.5-2 |
| 2.5.2 Miscellaneous Tables Not Permanently Core Resident..... | 2.5-6 |
| 2.6 SUBSTRUCTURE DATA ITEMS DESCRIPTIONS..... | 2.6-1 |
| 2.6.1 Substructure Data "Items" Description..... | 2.6-2 |
| 3. SUBROUTINE DESCRIPTIONS | |
| 3.1 INTRODUCTION..... | 3.1-1 |
| 3.2 ALPHABETICAL INDEX OF ENTRY POINTS FOR SUBROUTINE DESCRIPTIONS..... | 3.2-1 |
| 3.3 EXECUTIVE SUBROUTINE DESCRIPTIONS..... | 3.3-1 |
| 3.3.1 XSEMI (Executive Sequence Monitor, Preface)..... | 3.3-1 |
| 3.3.2 BTSTRP (Bootstrap Generator)..... | 3.3-2 |
| 3.3.3 SEMINT (Sequence Monitor Initialization)..... | 3.3-3 |
| 3.3.4 GNFIAT (Generate FIAT)..... | 3.3-5 |
| 3.3.5 ENDSYS (End-of-Link)..... | 3.3-6 |
| 3.3.6 SEARCH (Search, Load, and Execute Link)..... | 3.3-8 |
| 3.3.7 XSEMI (Link i main Program, i = 2,3,...)..... | 3.3-9 |
| 3.3.8 XSEMXX (Sequence Monitor - Deck Generator)..... | 3.3-11 |
| 3.3.9 GNFIAT (Generate FIAT)..... | 3.3-12 |
| 3.3.10 XEOT (End-of-tape)..... | 3.3-14 |
| 3.3.11 SSWTCH (Sense Switches)..... | 3.3-15 |

TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Page No.</u> |
|--|-----------------|
| 3.3.12 CONMSG (Console Message Writer)..... | 3.3-16 |
| 3.3.13 TTLPGC (Title Page Writer)..... | 3.3-17 |
| 3.3.14 SENTRN (Transliterator) (IBM 360-370 Only)..... | 3.3-19 |

TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Page No.</u> |
|--|-----------------|
| 4.144 FUNCTIONAL MODULE SCALAR (MATRIX ELEMENT EXTRACTOR)..... | 4.144-1 |
| 4.145 FUNCTIONAL MODULES PVECii (PARTITIONING VECTOR DATA GENERATED)..... | 4.145-1 |
| 4.146 FUNCTIONAL MODULE GPFDR (GRID POINT FORCE DATA RECOVERY)..... | 4.146-1 |
| 4.147 FUNCTIONAL MODULE SWITCH..... | 4.147-1 |
| 4.148 FUNCTIONAL MODULE COPY..... | 4.148-1 |
| 4.149 FUNCTIONAL MODULE ALG (AERODYNAMIC LOAD GENERATOR)..... | 4.149-1 |
| 4.150 FUNCTIONAL MODULE APDB (AERODYNAMIC POOL DISTRIBUTOR FOR BLADES)..... | 4.150-1 |
| 5 NASTRAN - OPERATING SYSTEM INTERFACES | |
| 5.1 INTRODUCTION..... | 5.1-1 |
| 5.3 NASTRAN ON THE IBM SYSTEM 360/370..... | 5.3-1 |
| 5.3.1 Introduction..... | 5.3-1 |
| 5.3.2 Input/Output..... | 5.3-1 |
| 5.3.3 Link Switching..... | 5.3-4 |
| 5.3.4 Overlay Considerations and Implementation of Open Core..... | 5.3-4 |
| 5.3.5 PARM Options..... | 5.3-6 |
| 5.3.6 Execution Deck Setup..... | 5.3-7 |
| 5.3.7 Physical Items and Generation of the NASTRAN System..... | 5.3-18 |
| 5.3.8 Machine Dependent Routines..... | 5.3-35 |
| 5.3.9 GINØ (Generalized Input/Output Processor for NASTRAN)..... | 5.3-42 |
| 5.3.10 Special Error Codes from NASTRAN on the System 360..... | 5.3-45 |
| 5.3.11 IBM 360/370 Overlay Diagrams..... | 5.3-46 |
| 5.4 NASTRAN ON THE UNIVAC 1108/1110 (EXEC 8)..... | 5.4-1 |
| 5.4.1 Introduction..... | 5.4-1 |
| 5.4.2 Input/Output..... | 5.4-1 |
| 5.4.3 Link Switching..... | 5.4-4 |
| 5.4.4 Overlay Considerations and Implementation of Open Core..... | 5.4-5 |

TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Page No.</u> |
|---|-----------------|
| 5.4.5 Execution Deck Setup..... | 5.4-7 |
| 5.4.6 Description of NASTRAN Physical Items and Generation of the NASTRAN Executable System..... | 5.4-10 |
| 5.4.7 Machine Dependent Routines..... | 5.4-17 |
| 5.4.8 GINØ (S-Generalized Input/Output Processor for NASTRAN)..... | 5.4-21 |
| 5.4.9 The CØNTRL Element..... | 5.4-22 |

TABLE OF CONTENTS (Continued)

| <u>Section</u> | <u>Page No.</u> |
|---|-----------------|
| 10.19.3 Card Name Restart Table..... | 10.19-4 |
| 10.19.4 Rigid Format Change Restart Table..... | 10.19-8 |
| 10.19.5 File Name Restart Table..... | 10.19-10 |
| 10.20 RESTART TABLES FOR MODAL FLUTTER ANALYSIS..... | 10.20-1 |
| 10.20.1 Bit Positions for Card Name Restart Table..... | 10.20-1 |
| 10.20.2 Bit Positions for File Name Restart Table..... | 10.20-3 |
| 10.20.3 Card Name Restart Table..... | 10.20-4 |
| 10.20.4 Rigid Format Change Restart Table..... | 10.20-11 |
| 10.20.5 File Name Restart Table..... | 10.20-13 |
| 10.21 RESTART TABLES FOR STATIC AEROELASTIC ANALYSIS..... | 10.21-1 |
| 10.21.1 Bit Positions for Card Name Restart Table..... | 10.21-1 |
| 10.21.2 Bit Positions for File Name Restart Table..... | 10.21-3 |
| 10.21.3 Card Name Restart Table..... | 10.21-4 |
| 10.21.4 Rigid Format Change Restart Table..... | 10.21-11 |
| 10.21.5 File Name Restart Table..... | 10.21-17 |
| 10.22 RESTART TABLES FOR COMPRESSOR BLADE CYCLIC MODAL FLUTTER... | 10.22-1 |
| 10.22.1 Bit Positions for Card Name Restart Table..... | 10.22-1 |
| 10.22.2 Bit Positions for File Name Restart Table..... | 10.22-3 |
| 10.22.3 Card Name Restart Table..... | 10.22-4 |
| 10.22.4 Rigid Format Change Restart Table | 10.22-10 |
| 10.22.5 File Name Restart Table..... | 10.22-15 |

DATA BLOCK DESCRIPTIONS - GENERAL COMMENTS AND INDEXES

2.2.1 Index for Data Block Descriptions Sorted on Data Block Names

| <u>Section Number</u> | <u>Data Block Name</u> | <u>Output from Module</u> | <u>Page Number</u> |
|-----------------------|------------------------|---------------------------|--------------------|
| 2.3.40.6 | ABFL | MTRXIN | 2.3-178 |
| 2.3.62.9 | ACPT | APD | 2.3-250 -p |
| 2.3.87.5 | ACPT | APDB | 2.3-297 |
| 2.3.62.8 | AERØ | APD | 2.3-250 |
| 2.3.87.1 | AERØ | APDB | 2.3-296 |
| 2.3.64.1 | AJJL | AMG | 2.3-254 |
| 2.3.47.2 | AUTØ | RANDØM | 2.3-223 |
| 2.3.2.11 | AXIC | IFP | 2.3-38 |
| 2.3.18.9 | BAA | SMP1 | 2.3-94 |
| 2.3.41.2 | BDD | GKAD | 2.3-179 |
| 2.3.70.6 | BDICT | EMG | 2.3-267 |
| 2.3.54.1 | BDPØØL | BMG | 2.3-239 |
| 2.3.70.5 | BELM | EMG | 2.3-267 |
| 2.3.17.8 | BFF | SCE1 | 2.3-89 |
| 2.3.69.1 | BGG | EMA | 2.3-264 |
| 2.3.10.2 | BGG | SMA2 | 2.3-76 |
| 2.3.77.4 | BGP | PLTMRG | 2.3-282 |
| 2.3.62.7 | BGPA | APD | 2.3-249 |
| 2.3.76.6 | BGPDT | SGEN | 2.3-279 |
| 2.3.3.5 | BGPDT | GPI | 2.3-44 |
| 2.3.55.2 | BGPDP | PLTTRAN | 2.3-239 |
| 2.3.49.2 | BHH | GKAM | 2.3-225 |
| 2.3.16.5 | BNN | MCE2 | 2.3-86 |
| 2.3.27.7 | BQG | SDR1 | 2.3-112 |
| 2.3.66.3 | BXHH | FA1 | 2.3-259 |
| 2.3.41.8 | B2DD | GKAU | 2.3-181 |
| 2.3.40.3 | R2PP | MTRXIN | 2.3-177 |
| 2.3.76.2 | CASEC | SGEN | 2.3-278 |
| 2.3.1.1 | CASECC | IFP1 | 2.3-1 |
| 2.3.86.1 | CASECCA | ALG | 2.3-295 |

DATA BLOCK DESCRIPTIONS - GENERAL COMMENTS AND INDEXES

| <u>Section Number</u> | <u>Data Block Name</u> | <u>Output from Module</u> | <u>Page Number</u> |
|-----------------------|------------------------|---------------------------|--------------------|
| 2.3.38.2 | ECPTNL1 | PLA4 | 2.3-175 |
| 2.3.4.1 | ECT | GP2 | 2.3-46 |
| 2.3.62.5 | ECTA | APD | 2.3-247 |
| 2.3.2.8 | EDT | IFP | 2.3-30 |
| 2.3.29.4 | EED | DPD | 2.3-147 |
| 2.3.77.3 | ELS | PLTMRG | 2.3-282 |
| 2.3.5.4 | ELSETS | PLTSET | 2.3-48 |
| 2.3.2.5 | EPT | IFP | 2.3-23 |
| 2.3.62.4 | EQAERØ | APD | 2.3-247 |
| 2.3.29.5 | EQDYN | DPD | 2.3-149 |
| 2.3.77.6 | EQEX | PLTNRG | 2.3-283 |
| 2.3.3.2 | EQEXIN | GPI | 2.3-41 |
| 2.3.76.4 | EQEXIN | SGEN | 2.3-278 |
| 2.3.8.1 | EST | TA1 | 2.3-56 |
| 2.3.34.2 | ESTL | PLA1 | 2.3-165 |
| 2.3.34.3 | ESTNL | PLA1 | 2.3-166 |
| 2.3.37.2 | ESTNL1 | PLA3 | 2.3-174 |
| 2.3.29.9 | FRL | DPD | 2.3-153 |
| 2.3.62.11 | FLIST | APD | 2.3-252 |
| 2.3.87.2 | FLIST | APDB | 2.3-296 |
| 2.3.66.1 | FSAVE | FA1 | 2.3-258 |
| 2.3.84.4 | GCYCB | CYCT1 | 2.3-293 |
| 2.3.84.3 | GCYCF | CYCT1 | 2.3-292 |
| 2.3.8.2 | GEI | TA1 | 2.3-70 |
| 2.3.2.1 | GEØM1 | IFP | 2.3-7 |
| 2.3.2.2 | GEØM2 | IFP | 2.3-9 |
| 2.3.2.3 | GEØM3 | IFP | 2.3-16 |
| 2.3.86.2 | GEØM3A | ALG | 2.3-295 |
| 2.3.2.4 | GEØM4 | IFP | 2.3-19 |
| 2.3.15.1 | GM | MCE1 | 2.3-84 |
| 2.3.41.4 | GMD | GKAD | 2.3-180 |

DATA BLOCK AND TABLE DESCRIPTIONS

| <u>Section Number</u> | <u>Data Block Name</u> | <u>Output from Module</u> | <u>Page Number</u> |
|-----------------------|------------------------|---------------------------|--------------------|
| 2.3.18.1 | GØ | SMP1 | 2.3-92 |
| 2.3.41.5 | GØD | GKAD | 2.3-180 |
| 2.3.8.4 | GPCT | TA1 | 2.3-71 |
| 2.3.76.5 | GPDT | SGEN | 2.3-279 |
| 2.3.3.3 | GPDT | GP1 | 2.3-42 |
| 2.3.8.7 | GPECT | TA1 | 2.3-73 |
| 2.3.3.1 | GPL | GP1 | 2.3-41 |
| 2.3.76.3 | GPL | SGEN | 2.3-278 |
| 2.3.62.1 | GPLA | APD | 2.3-245 |
| 2.3.29.1 | GPLD | DPD | 2.3-145 |
| 2.3.77.2 | GPS | PLTMRG | 2.3-281 |
| 2.3.5.3 | GPSETS | PLTSET | 2.3-47 |
| 2.3.9.3 | GPST | SMA1 | 2.3-74 |
| 2.3.69.2 | GPST | EMA | 2.3-264 |
| 2.3.7.2 | GPYT | GP3 | 2.3-54 |
| 2.3.76.8 | GP3S | SGEN | 2.3-279 |
| 2.3.76.9 | GP4S | SGEN | 2.3-280 |
| 2.3.63.1 | GTKA | GI | 2.3-253 |
| 2.3.87.3 | GTKA | APDB | 2.3-296 |
| 2.3.32.3 | HBAA | SMP2 | 2.3-162 |
| 2.3.41.10 | HBDD | GKAD | 2.3-181 |
| 2.3.70.10 | HBDICT | EMG | 2.3-268 |
| 2.3.70.9 | HBELM | EMG | 2.3-268 |
| 2.3.17.14 | HBFF | SCE1 | 2.3-91 |
| 2.3.69.1 | HBGG | EMA | 2.3-264 |
| 2.3.16.8 | HBNN | MCE2 | 2.3-87 |
| 2.3.41.15 | HB2DD | GKAD | 2.3-182 |
| 2.3.40.5 | HB2PP | MTRXIN | 2.3-177 |
| 2.3.29.14 | HDLT | DPD | 2.3-156 |
| 2.3.21.2 | HDM | RBMG3 | 2.3-101 |
| 2.3.29.17 | HEQDYN | DPD | 2.3-156 |

DATA BLOCK AND TABLE DESCRIPTIONS

| <u>Section Number</u> | <u>Data Block Name</u> | <u>Output from Module</u> | <u>Page Number</u> |
|-----------------------|------------------------|---------------------------|--------------------|
| 2.3.28.25 | PPHIG | SDR2 | 2.3-140 |
| 2.3.57.1 | PPT | TRLG | 2.3-240 |
| 2.3.24.3 | PS | SSG2 | 2.3-104 |
| 2.3.47.1 | PSDF | RAHDØM | 2.3-222 |
| 2.3.29.8 | PSDL | DPD | 2.3-152 |
| 2.3.44.2 | PSF | FRRD | 2.3-195 |
| 2.3.74.4 | PSS | RCØVR3 | 2.3-274 |
| 2.3.57.2 | PST | TRLG | 2.3-240 |
| 2.3.28.24 | PUBGV1 | SDR2 | 2.3-139 |
| 2.3.28.26 | PUGV | SDR2 | 2.3-141 |
| 2.3.28.23 | PUGV1 | SDR2 | 2.3-138 |
| 2.3.28.27 | PUPVC1 | SDR2 | 2.3-142 |
| 2.3.87.4 | PVECT | APDB | 2.3-296 |
| 2.3.75.1 | PVX | REDUCE | 2.3-276 |
| 2.3.84.1 | PX | CYCT1 | 2.3-292 |
| 2.3.74.2 | QAS | RCØVR3 | 2.3-274 |
| 2.3.27.6 | QBG | SDR1 | 2.3-112 |
| 2.3.27.3 | QG | SDR1 | 2.3-111 |
| 2.3.36.3 | QG1 | PLA2 | 2.3-173 |
| 2.3.65.1 | QHHL | AMP | 2.3-256 |
| 2.3.65.2 | QJHL | AMP | 2.3-256 |
| 2.3.27.15 | QP | SDR1 | 2.3-114 |
| 2.3.27.12 | QPC | SDR1 | 2.3-113 |
| 2.3.24.1 | QR | SSG2 | 2.3-104 |
| 2.3.13.1 | RG | GP4 | 2.3-79 |
| 2.3.25.6 | RUBLV | SSG3 | 2.3-108 |
| 2.3.25.3 | RULV | SSG3 | 2.3-107 |
| 2.3.25.4 | RUØV | SSG3 | 2.3-107 |
| 2.3.85.4 | RUXV | CYCT2 | 2.3-294 |
| 2.3.76.7 | SIL | SGEN | 2.3-279 |
| 2.3.3.6 | SIL | GP1 | 2.3-45 |

DATA BLOCK AND TABLE DESCRIPTIONS

2.2.2 Index for Data Block Descriptions Sorted Alphabetically by Module

| Section Number | Module | Page Number | Section Number | Module | Page Number |
|----------------|---------|-------------|----------------|---------|-------------|
| 2.3.35 | ADD | 2.3-172 | 2.3.34 | PLA1 | 2.3-165 |
| 2.3.86 | ALG | 2.3-295 | 2.3.36 | PLA2 | 2.3-173 |
| 2.3.64 | AMG | 2.3-254 | 2.3.37 | PLA3 | 2.3-174 |
| 2.3.65 | AMP | 2.3-256 | 2.3.38 | PLA4 | 2.3-175 |
| 2.3.62 | APD | 2.3-245 | 2.3.6 | PLØT | 2.3-50 |
| 2.3.87 | APDB | 2.3-296 | 2.3.77 | PLTMRG | 2.3-281 |
| 2.3.71 | ASDMAP | 2.3-269 | 2.3.5 | PLTSET | 2.3-47 |
| 2.3.54 | BMG | 2.3-239 | 2.3.55 | PLTTRAN | 2.3-239 |
| 2.3.39 | CASE | 2.3-176 | 2.3.82 | PVEC05 | 2.3-289 |
| 2.3.42 | CEAD | 2.3-183 | | PVEC10 | |
| 2.3.72 | CØMB2 | 2.3-271 | | PVEC20 | |
| 2.3.84 | CYCT1 | 2.3-292 | 2.3.47 | RANDØM | 2.3-222 |
| 2.3.85 | CYCT2 | 2.3-293 | 2.3.19 | RBMG1 | 2.3-96 |
| 2.3.79 | DDRMM | 2.3-285 | 2.3.20 | RBMG2 | 2.3-99 |
| 2.3.50 | DDR1 | 2.3-226 | 2.3.21 | RBMG3 | 2.3-101 |
| 2.3.53 | DDR2 | 2.3-237 | 2.3.22 | RBMG4 | 2.3-102 |
| 2.3.29 | DPD | 2.3-145 | 2.3.73 | RCØVR | 2.3-272 |
| 2.3.31 | DSMG1 | 2.3-161 | 2.3.74 | RCØVR3 | 2.3-274 |
| 2.3.33 | DSMG2 | 2.3-163 | 2.3.30 | READ | 2.3-157 |
| 2.3.69 | EMA | 2.3-264 | 2.3.75 | REDUCE | 2.3-276 |
| 2.3.70 | EMG | 2.3-265 | 2.3.56 | RMG | 2.3-240 |
| 2.3.66 | FA1 | 2.3-258 | 2.3.17 | SCE1 | 2.3-88 |
| 2.3.67 | FA2 | 2.3-260 | 2.3.60 | SDRHT | 2.3-243 |
| 2.3.44 | FRRD | 2.3-115 | 2.3.27 | SDR1 | 2.3-111 |
| 2.3.63 | GI | 2.3-253 | 2.3.28 | SDR2 | 2.3-116 |
| 2.3.41 | GKAD | 2.3-179 | 2.3.45 | SDR3 | 2.3-197 |
| 2.3.49 | GKAM | 2.3-225 | 2.3.76 | SGEN | 2.3-278 |
| 2.3.61 | GPCYC | 2.3-244 | 2.3.9 | SMA1 | 2.3-74 |
| 2.3.83 | GPFDOR | 2.3-290 | 2.3.10 | SMA2 | 2.3-76 |
| 2.3.3 | GP1 | 2.3-41 | 2.3.12 | SMA3 | 2.3-78 |
| 2.3.4 | GP2 | 2.3-46 | 2.3.18 | SMP1 | 2.3-92 |
| 2.3.7 | GP3 | 2.3-51 | 2.3.32 | SMP2 | 2.3-162 |
| 2.3.13 | GP4 | 2.3-79 | 2.3.59 | SSGHT | 2.3-242 |
| 2.3.14 | GPSP | 2.3-83 | 2.3.23 | SSG1 | 2.3-103 |
| 2.3.11 | GPWG | 2.3-77 | 2.3.24 | SSG2 | 2.3-104 |
| 2.3.2 | IFP | 2.3-5 | 2.3.25 | SSG3 | 2.3-107 |
| 2.3.1 | IFP1 | 2.3-1 | 2.3.26 | SSG4 | 2.3-110 |
| 2.3.81 | INPUTT2 | 2.3-288 | 2.3.8 | TA1 | 2.3-56 |
| 2.3.15 | MCE1 | 2.3-84 | 2.3.48 | TRD | 2.3-224 |
| 2.3.16 | MCE2 | 2.3-85 | 2.3.58 | TRHT | 2.3-242 |
| 2.3.78 | MØDACC | 2.3-284 | 2.3.57 | TRLG | 2.3-240 |
| 2.3.40 | MTRXIN | 2.3-177 | 2.3.43 | VDR | 2.3-186 |
| 2.3.68 | ØPTPR1 | 2.3-262 | 2.3.46 | XYTRAN | 2.3-218 |
| 2.3.80 | ØPTPR2 | 2.3-287 | | | |

DATA BLOCK AND TABLE DESCRIPTIONS

Card Type Formats Cont'd.:

| | | | |
|---|---|--|--|
| BDYS (Open Ended) | SID G2 ... | G1 C2 -1 | G1 -1 |
| BDYS1 (Open Ended) | SID G2 ... | C ... | G1 -1 |
| CØNCT (Open Ended) | SID SUBB GA ... | C GA GB -1 | SUBA GB ... -1 |
| CØNCT1 (Open Ended) | NSUB ... G11 C2 G2, NSUB | SID NAME NSUB ... G21 ... | NAME1 C1 G1, NSUB ... -1 |
| CRIGD1 (Open Ended) and CRIGD2 (Open Ended) | EID G11 G14 G2 G23 G26 GM1 GM4 -1 -1 -1 | IG G12 G15 G21 G24 ... GM2 GM5 N -1 | G1 G13 G16 G22 G25 GM GM3 GM6 -1 -1 |
| CSP (open ended) | SID GA2 ... -1 | GA1 GB2 GAn -1 | GB1 ... GBn |
| CYJØIN (Open Ended) | SIDE G2 ... | C ... | G1 -1 |
| GNEW (5 words) | SID GID ... | NAME GIDØ ... | C |
| GTRAN (4 words) | TID TRAN ... | NAME ... | GID |
| LØADC (Open Ended) | SID NAME2 -1 | S ID1 ... (blank) -1 | NAME1 S1 ... (blank) |
| MPC (Open Ended) | SID A A C -1 | G G ... A -1 | C C G -1 |
| MPCADD (Open Ended) | SID | S1 Sn ... | S2 -1 |
| MPCAX (Open Ended) | SID V ... -1 | RID ... -1 | C ... -1 |

See Section 4.6.2 for additional information.

DATA BLOCK DESCRIPTIONS

2.3.86 Data Blocks Output from Module ALG

2.3.86.1 CASECCA (Table)

Description

See description and format of CASECC table - Section 2.3.1.1.

2.3.86.2 GEOM3A (Table)

Description

See description and format of GEOM3 table - Section 2.3.2.3.

DATA BLOCK DESCRIPTIONS

2.3.87 Data Blocks Output from Module APDB

2.3.87.1 AERØ (Table)

Description

See description and format of AERØ table - Section 2.3.62.8.

2.3.87.2 FLIST (Table)

Description

See description and format of FLIST table - Section 2.3.62.11.

2.3.87.3 GTKA (Matrix)

Description

See description and format of GTKA matrix - Section 2.3.63.1.

2.3.87.4 PVECT (Matrix)

Description

{ PVECT } - Partitioning vector for cyclic modes.

Matrix Trailer

| | |
|-------------------|-------------------------------------|
| Number of columns | = 1 |
| Number of rows | = NEIGV (for KINDEX > 0, 2 * NEIGV) |
| Form | = rectangular |
| Type | = real-single precision |

DATA BLOCK DESCRIPTIONS

2.3.87.5 ACPT (Table)

Description

Aerodynamic connection and property table for compressor blades. Contains one record for each compressor blade.

Table Format

| <u>Record</u> | <u>Word</u> | <u>Type</u> | <u>Item</u> |
|---------------|-------------|-------------|--|
| 0 | 1-2 | B | Data block name (ACPT) |
| 1 | 1 | I | Key word, 6 for compressor blades |
| | 2 | I | IREF parameter |
| | 3 | R | MINMACH parameter |
| | 4 | R | MAXMACH parameter |
| | 5 | I | Number of blade streamlines, NLINES |
| | 6 | I | Number of stations on blade, NSTNS |
| | 7 | I | Streamline number, SLN |
| | 8 | I | Number of stations on streamline, NSTNSX |
| | 9 | R | Stagger angle, STAGGER |
| | 10 | R | Chord length, CHORD |
| | 11 | R | Radius of streamline, RADIUS |
| | 12 | R | Blade spacing, BSPACE |
| | 13 | R | Mach number, MACH |
| | 14 | R | Gas density, DEN |
| | 15 | R | Flow velocity, VEL |
| | 16 | R | Flow angle, FLOWA |
| | 17 | R | X-coordinate, basic |
| | 18 | R | Y-coordinate, basic |
| | 19 | R | Z-coordinate, basic |
| 2 | | | Additional records for other blade |

Table Trailer

Word 1 = 1
Word 2-6 = zero

Notes

- Words 7-19 are repeated for each streamline. There are NLINES streamlines and they are from the blade root to the blade tip. These data items are taken from the STREAML2 bulk data cards.
- Words 17-19 are repeated for each node on the streamline. There are NSTNS triplets (X, Y, Z). They are from the blade leading edge to the blade trailing edge.

EXECUTIVE TABLE DESCRIPTIONS

| MODULE PROPERTIES LIST | | | | | | | | | | |
|------------------------|------|------|----------|-----|----|-----|-----|-----|---|--|
| PARA M E T E R S | | | | | | | | | | |
| DEFAULT (IF ANY) | | | | | | | | | | |
| W1-W2 FLG | | | | | | | | | | |
| MPLID | NWDS | WD1 | MOD-NAME | TYP | IN | OUT | SCP | TOT | ID TYP P | |
| 162 | 15 | 2242 | EQMCK | 1 | 12 | 1 | 7 | 20 | 1. INT 2249 2. INT 2251 3. INT 2253 4. BCD 2254 | |
| | | | | | | | | | 0 -1 -- NO DEFAULT -- NOVE | |
| | | | | | | | | | 1 2 3 4-5 | |
| 163 | 29 | 2257 | ALG | 1 | 7 | 2 | 4 | 13 | 1. INT 2264 2. INT 2266 3. INT 2268 4. INT 2270 5. INT 2272 6. INT 2274 7. KSP 2276 8. PSP 2278 9. PSP 2280 10. PSP 2282 11. PSP 2284 | |
| | | | | | | | | | -1 -1 -1 -1 0 0 1.0000E 00 0.0 1.0000E 00 1.0000E 00 1.0000E 00 | |
| | | | | | | | | | 1 2 3 4 5 6 7 8 9 10 11 | |
| 164 | 7 | 2286 | CSA | 1 | 4 | 1 | 1 | 6 | ----- NO P A R A M E T E R S E X I S T ----- | |
| 165 | 20 | 2293 | APDB | 1 | 7 | 5 | 5 | 17 | 1. INT 2300 2. INT 2301 3. PSP 2302 4. RSP 2304 5. INT 2306 6. BCD 2308 7. INT 2311 8. INT 2312 | |
| | | | | | | | | | -- NO DEFAULT -- -- NO DEFAULT -- 1.0100E 00 8.0000E-01 -1 CSIVE -- NO DEFAULT -- -- NO DEFAULT -- | |
| | | | | | | | | | 1 2 3 4 5 6-7 8 9 | |

DATA BLOCK AND TABLE DESCRIPTIONS

MODULE PROPERTIES LIST
 MPLID NWDS W01 MOD-NAME TYP IN OUT SCR TOT ID TYP P P A P A M F T E P S - - - - -
 *** END OF MPL PRINTOUT
 *** THE MPL CONTAINS 165 ENTRIES. OF THESE, 0 ARE PAD ENTRIES.

WI-W2 FLG

| Case | Year | Age | Sex | Location | Occupation | History | Findings | Diagnosis | Outcome |
|------|------|-----|-----|----------|------------|---------|--------------|--------------|--------------|
| 1 | 1998 | 45 | M | USA | Farmer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 2 | 1999 | 52 | F | USA | Teacher | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 3 | 2000 | 38 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 4 | 2001 | 60 | F | USA | Retired | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 5 | 2002 | 41 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 6 | 2003 | 55 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 7 | 2004 | 33 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 8 | 2005 | 48 | F | USA | Teacher | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 9 | 2006 | 50 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 10 | 2007 | 42 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 11 | 2008 | 35 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 12 | 2009 | 58 | F | USA | Retired | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 13 | 2010 | 40 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 14 | 2011 | 53 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 15 | 2012 | 37 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 16 | 2013 | 49 | F | USA | Teacher | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 17 | 2014 | 51 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 18 | 2015 | 43 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 19 | 2016 | 36 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 20 | 2017 | 56 | F | USA | Retired | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 21 | 2018 | 44 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 22 | 2019 | 54 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 23 | 2020 | 39 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 24 | 2021 | 57 | F | USA | Teacher | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 25 | 2022 | 46 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 26 | 2023 | 47 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 27 | 2024 | 34 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 28 | 2025 | 59 | F | USA | Retired | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 29 | 2026 | 41 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 30 | 2027 | 52 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 31 | 2028 | 38 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 32 | 2029 | 50 | F | USA | Teacher | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 33 | 2030 | 51 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 34 | 2031 | 43 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 35 | 2032 | 36 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 36 | 2033 | 56 | F | USA | Retired | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 37 | 2034 | 44 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 38 | 2035 | 47 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 39 | 2036 | 34 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 40 | 2037 | 59 | F | USA | Retired | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 41 | 2038 | 41 | M | USA | Engineer | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 42 | 2039 | 52 | F | USA | Homemaker | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 43 | 2040 | 38 | M | USA | Student | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 44 | 2041 | 50 | F | USA | Teacher | None | Asymptomatic | Asymptomatic | Asymptomatic |
| 45 | 2042 | | | | | | | | |

[illegible]

GENERAL COMMENTS AND INDEXES

4.1.2 Alphabetical Index of Module Functional Descriptions

| <u>Section Number</u> | <u>Module Name</u> | <u>Section Number</u> | <u>Module Name</u> |
|-----------------------|--------------------|-----------------------|--------------------|
| 4.78 | ADD | 4.32 | GPSP |
| 4.96 | ADD5 | 4.29 | GPWG |
| 4.149 | ALG | 4.21 | GP1 |
| 4.114 | ANG | 4.22 | GP2 |
| 4.115 | AMP | 4.25 | GP3 |
| 4.112 | APD | 4.31 | GP4 |
| 4.150 | APDB | | |
| 4.217 | ASOMAP | | |
| *** | BEGIN | 4.5 | IFP* |
| 4.90 | BMG | 4.3 | IFP1 |
| 4.56 | CASE | 4.6 | IFP3* |
| 4.59 | CEAD | 4.89 | IFP4* |
| 4.10 | CHKPNT | 4.91 | IFP5* |
| 4.128 | CØMB1 | 4.97 | INPUT |
| 4.129 | CØMB2 | 4.98 | INPUTT1 |
| 4.13 | CØND | 4.99 | INPUTT2 |
| 4.148 | CØPY | ** | INPUTT3 |
| 4.110 | CYCT1 | ** | INPUTT4 |
| 4.111 | CYCT2 | 4.12 | JUMP |
| ** | DDR | ** | LABEL |
| 4.141 | DDRM | 4.72 | MATGPR |
| 4.67 | DDR1 | 4.71 | MATPRN |
| 4.68 | DDR2 | 4.73 | MATPRT |
| 4.81 | DECØMP | 4.33 | MCE1 |
| 4.143 | DIAGØNAL | 4.34 | MCE2 |
| 4.47 | DPD | 4.84 | MERGE |
| 4.121 | DSCHK | ** | MØDA |
| 4.49 | DSMG1 | 4.126 | MØDACG |
| 4.51 | DSMG2 | ** | MØDB |
| ** | DUMMØD1 | ** | MØDC |
| ** | DUMMØD2 | 4.79 | MPYAD |
| ** | DUMMØD3 | 4.57 | MTRXIN |
| ** | DUMMØD4 | 4.70 | ØFP |
| 4.123 | EMA | 4.120 | ØTPR1 |
| 4.124 | EMG | 4.142 | ØTPR2 |
| 4.18 | END | ** | ØUTPUT |
| 4.17 | EQUIV | 4.100 | ØUTPUT1 |
| 4.130 | EXIØ | 4.101 | ØUTPUT2 |
| 4.14 | EXIT | 4.102 | ØUTPUT3 |
| | | ** | ØUTPUT4 |
| 4.116 | FA1 | 4.19 | PARAM |
| 4.117 | FA2 | 4.118 | PARAML |
| 4.82 | FBS | 4.119 | PARAMR |
| *** | FILE | 4.83 | PARTN |
| 4.61 | FRRD | ** | PARTVEC |
| | | 4.52 | PLA1 |
| 4.113 | GI | 4.53 | PLA2 |
| 4.58 | GKAD | 4.54 | PLA3 |
| 4.66 | GKAM | 4.55 | PLA4 |
| 4.109 | GPCYC | 4.24 | PLØT |
| 4.146 | GPFOR | | |

* Executive System Internal Module, ** Dummy Module,
 *** Executive System Instruction (No Module Functional Descriptions)

MODULE FUNCTIONAL DESCRIPTIONS

4.1.3 Alphabetical Index of Entry Points in Module Functional Descriptions

| <u>Section Number</u> | <u>Entry Point</u> | <u>Module Name</u> | <u>Page Number</u> |
|-----------------------|--------------------|--------------------|--------------------|
| 4.46.8 | AI | SDR2 | 4.46-7 |
| 4.114.8.18 | AKAPM | AMG | 4.114-9b |
| 4.114.8.18 | AKAPPA | AMG | 4.114-9b |
| 4.114.8.18 | AKP2 | AMG | 4.114-9b |
| 4.114.8.18 | ALAMDA | AMG | 4.114-9b |
| 4.59.8.25 | ALLMAT | CEAD | 4.59-18 |
| 4.46.8 | AMATRX | SDR2 | 4.46-7 |
| 4.114.1 | AMG | AMG | 4.114-1 |
| 4.114.8.12 | AMGB1 | AMG | 4.114-9 |
| 4.114.8.13 | AMGB1A | AMG | 4.114-9 |
| 4.114.8.14 | AMGB1B | AMG | 4.114-9a |
| 4.114.8.15 | AMGB1C | AMG | 4.114-9a |
| 4.114.8.16 | AMGB1D | AMG | 4.114-9b |
| 4.114.8.20 | AMGB2 | AMG | 4.114-9c |
| 4.114.8.21 | AMGB2A | AMG | 4.114-9c |
| 4.115.1 | AMP | AMP | 4.115-1 |
| 4.115.8.1 | AMPA | AMP | 4.115-8 |
| 4.115.8.2 | AMPB | AMP | 4.115-9 |
| 4.115.8.3 | AMPB1 | AMP | 4.115-9 |
| 4.115.8.4 | AMPB2 | AMP | 4.115-10 |
| 4.115.8.5 | AMPC | AMP | 4.115-10 |
| 4.115.8.6 | AMPC1 | AMP | 4.115-10 |
| 4.115.8.7 | AMPC2 | AMP | 4.115-12 |
| 4.115.8.8 | AMPD | AMP | 4.115-12 |
| 4.112.1 | APD | APD | 4.112-1 |
| 4.150.8 | APDB | APDB | 4.150-1 |
| 4.150.8.1 | APDB1 | APDB | 4.150-4 |
| 4.112.8.2 | APDF | APD | 4.112-3 |
| 4.112.8.1 | APD1 | APD | 4.112-3 |
| 4.48.8.25 | ARRM | READ | 4.48-18 |
| 4.127.1 | ASDMAP | ASDMAP | 4.127-1 |
| 4.127.8.1 | ASPRØ | ASDMAP | 4.127-6 |
| 4.114.8.18 | ASYCØN | AMG | 4.114-9b |
| 4.7.5.13 | AUTØCK | XGPI | 4.7-6 |
| 4.7.5.14 | AUTØSV | XGPI | 4.7-7 |
| 4.41.11.35 | BAK | SSG1 | 4.41-27 |
| 4.41.11.21 | BASGLB | SSG1 | 4.41-22 |
| 4.128.8.4 | BDAT01 | CØMB1 | 4.128-11 |

MODULE FUNCTIONAL DESCRIPTIONS

| <u>Section Number</u> | <u>Entry Point</u> | <u>Module Name</u> | <u>Page Number</u> |
|-----------------------|--------------------|--------------------|--------------------|
| 4.128.8.5 | BDAT02 | CØMB1 | 4.128-12 |
| 4.128.8.8 | BDAT03 | CØMB1 | 4.128-14 |
| 4.128.8.10 | BDAT04 | CØMB1 | 4.128-20 |
| 4.128.8.6 | BDAT05 | CØMB1 | 4.128-12 |
| 4.128.8.7 | BDAT06 | CØMB1 | 4.128-13 |

GENERAL COMMENTS AND INDEXES

| <u>Section Number</u> | <u>Entry Point</u> | <u>Module Name</u> | <u>Page Number</u> |
|-----------------------|--------------------|--------------------|--------------------|
| 4.41.11.17 | FNDPNT | SSG1 | 4.41-21 |
| 4.24.8.12 | FNDSET | PLØT | 4.24-11 |
| 4.41.11.20 | FND SIL | SSG1 | 4.41-22 |
| 4.73.8.4 | FØRMAT | MATPRT | 4.73-4 |
| 4.31.8.3 | FØRMGG | GP4 | 4.31-6 |
| 4.65.8.4 | FØRM1 | TRD | 4.65-12 |
| 4.65.8.10 | FØRM2 | TRD | 4.65-15 |
| 4.41.11.10 | FPØNT | SSG1 | 4.41-19 |
| 4.61.1 | FRRD | FRRD | 4.61-1 |
| 4.61.8.1 | FRRD1A | FRRD | 4.61-5 |
| 4.61.8.2 | FRRD1B | FRRD | 4.61-6 |
| 4.61.8.3 | FRRD1C | FRRD | 4.61-6 |
| 4.61.8.4 | FRRD1D | FRRD | 4.61-6 |
| 4.61.8.5 | FRRD1E | FRRD | 4.61-7 |
| 4.61.8.6 | FRRD1F | FRRD | 4.61-7 |
| 4.46.8 | F6211 | SDR2 | 4.46-7 |
| 4.46.8 | F89 | SDR2 | 4.46-7 |
| 4.114.8.19 | GAUSS | AMG | 4.114-9c |
| 4.41.11.60 | GBTRAN | SSG1 | 4.41-35 |
| 4.114.8.3 | GEND | AMG | 4.114-4 |
| 4.24.8.4 | GETDEF | PLØT | 4.24-6 |
| 4.113.8.1 | GI | GI | 4.113-8 |
| 4.113.8.2 | GIGGKS | GI | 4.113-8 |
| 4.113.8.4 | GIGTKA | GI | 4.113-8 |
| 4.113.8.3 | GIPSST | GI | 4.113-8 |
| 4.58.1 | GKAD | GKAD | 4.58-1 |
| 4.58.8.1 | GKAD1A | GKAD | 4.58-7 |
| 4.58.8.2 | GKAD1B | GKAD | 4.58-7 |
| 4.58.8.3 | GKAD1C | GKAD | 4.58-8 |
| 4.58.8.4 | GKAD1D | GKAD | 4.58-8 |

GENERAL COMMENTS AND INDEXES

| <u>Section Number</u> | <u>Entry Point</u> | <u>Module Name</u> | <u>Page Number</u> |
|-----------------------|--------------------|--------------------|--------------------|
| 4.46.8.7 | STRBS1 | SDR2 | 4.46-10 |
| 4.46.8.53 | STRIA1 | SDR2 | 4.46-23 |
| 4.46.8.55 | STRIA2 | SDR2 | 4.46-23 |
| 4.46.8.16 | STRIR1 | SDR2 | 4.46-12 |
| 4.46.8.32 | STRIR2 | SDR2 | 4.46-17 |
| 4.46.8.10 | STRME1 | SDR2 | 4.46-11 |
| 4.46.8.8 | STRPL1 | SDR2 | 4.46-10 |
| 4.46.8.13 | STRQD1 | SDR2 | 4.46-12 |
| 4.46.8.28 | STRQD2 | SDR2 | 4.46-16 |
| 4.46.8.5 | STUBE1 | SDR2 | 4.46-10 |
| 4.48.8.13 | SUB | READ | 4.48-11 |
| 4.114.8.18 | SUBA | AMG | 4.114-9b |
| 4.114.8.18 | SUBB | AMG | 4.114-9b |
| 4.114.8.18 | SUBC | AMG | 4.114-9b |
| 4.114.8.18 | SUBD | AMG | 4.114-9b |
| 4.114.8.5 | SUBP | AMG | 4.114-5 |
| 4.138.1 | SUBPH1 | SUBPH1 | 4.138-1 |
| 4.48.8.26 | SUMM | READ | 4.48-18 |
| 4.24.8.19 | SUPLT | PLDT | 4.24-12c |
| 4.147.1 | SWITCH | SWITCH | 4.147-1 |
| 4.3.7.7 | SWSRT | IFP1 | 4.3-6 |
| 4.103.1 | TABFMT | TABPRT | 4.103-1 |
| 4.122.1 | TABPCH | TABPCH | 4.122-1 |
| 4.75.1 | TABPT | TABPT | 4.75-1 |
| 4.26.8.1 | TA1 | TA1 | 4.26-14 |
| 4.26.8.2 | TA1A | TA1 | 4.26-14 |
| 4.26.8.3 | TA1B | TA1 | 4.26-15 |
| 4.26.8.5 | TA1C | TA1 | 4.26-15 |
| 4.26.8.6 | TA1CA | TA1 | 4.26-15 |
| 4.26.8.8 | TA1ETD | TA1 | 4.26-15 |
| 4.26.8.4 | TA1H | TA1 | 4.26-15 |
| 4.41.11.3 | TEMPL | SSG1 | 4.41-15 |
| 4.41.11.43 | TETRA | SSG1 | 4.41-29 |
| 4.140.1 | TIMTST | TIMETEST | 4.140-1 |

GENERAL COMMENTS AND INDEXES

| <u>Section Number</u> | <u>Entry Point</u> | <u>Module Name</u> | <u>Page Number</u> |
|-----------------------|--------------------|--------------------|--------------------|
| 4.85.1 | TRNSP | TRNSP | 4.85-1 |
| 4.41.11.58 | TRITEM | SSG1 | 4.41-34 |
| 4.41.11.46 | TRPLT | SSG1 | 4.41-30 |
| 4.41.11.30 | TTORDR | SSG1 | 4.41-25 |
| 4.41.11.29 | TTRAPR | SSG1 | 4.41-25 |
| 4.41.11.56 | TTRIAS | SSG1 | 4.41-33 |
| 4.41.11.28 | TTRIRG | SSG1 | 4.41-25 |
| 4.149.8.5 | UDG1-UDG9 | ALG | 4.149-6 |
| 4.149.8.5 | UD03AH | ALG | 4.149-6 |
| 4.149.8.5 | UD03AP | ALG | 4.149-5 |
| 4.149.8.5 | UD03AR | ALG | 4.149-6 |
| 4.149.8.3 | UD03PB | ALG | 4.149-4 |
| 4.149.8.4 | UD03P0 | ALG | 4.149-4 |
| 4.149.8.2 | UD03PR | ALG | 4.149-4 |
| 4.149.8 | UD0300 | ALG | 4.149-1 |
| 4.149.8.5 | UD0301-UD0319 | ALG | 4.149-6 |
| 4.149.8.5 | UD0325 | ALG | 4.149-6 |
| 4.149.8.5 | UD0329 | ALG | 4.149-6 |
| 4.149.8.5 | UD0330 | ALG | 4.149-6 |
| 4.8.1 | UMFEDT | UMFEDIT | 4.8-1 |
| 4.8.6 | UMFZBD | UMFEDIT | 4.8-2 |
| 4.48.8.29 | VALVEC | READ | 4.48-19 |
| 4.60.8.1 | VDR | VDR | 4.60-6 |
| 4.60.8.2 | VDRA | VDR | 4.60-6 |
| 4.60.8.3 | VDRB | VDR | 4.60-6 |
| 4.60.9.2 | VDRBD | VDR | 4.60-7 |
| 4.95.1 | VEC | VEC | 4.95-1 |
| 4.73.8.3 | VECPRT | MATPRT | 4.73-3 |
| 4.48.8.39 | WILVEC | READ | 4.48-19e |

GENERAL COMMENTS AND INDEXES

| <u>Section Number</u> | <u>Entry Point</u> | <u>Module Name</u> | <u>Page Number</u> |
|-----------------------|--------------------|--------------------|--------------------|
| 4.76.8.2 | WRTMSG | PRTMSG | 4.76-2 |
| 4.24.8.17 | WRTprt | PLDT | 4.24-12a |
| 4.4.5.5 | XBCDBI | XSORT | 4.4-4 |
| 4.7.6.2 | XBSBD | XGPI | 4.7-10 |
| 4.11.1 | XCEI | REPT | 4.11-1 |
| 4.11.6.1 | XCEI | REPT | 4.11-2 |
| 4.12.1 | XCEI | JUMP | 4.12-1 |
| 4.13.1 | XCEI | END | 4.13-1 |
| 4.14.1 | XCEI | EXIT | 4.14-1 |
| 4.18.1 | XCEI | END | 4.18-1 |
| 4.10.1 | XCHK | CHKPNT | 4.10-1 |
| 4.9.5.2 | XCLEAN | XSFA | 4.9-4 |

EXECUTIVE PREFACE MODULE IFP (INPUT FILE PROCESSOR)

Table 1(g). Bulk Data Cards Processed by IFP Sorted by Internal Card Number.

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O IJKH |
|-----|----------|----|---------|----|----|----|------|---|------|----|----|------|----|-----------|
| 233 | QHBDY | 9 | GEOM3 | 0 | 9 | 9 | 901 | 0 | 4309 | 43 | S1 | 5050 | -1 | 32D5 |
| 234 | MAT4 | 3 | MPT | 0 | 4 | 8 | 198 | 1 | 2103 | 21 | S1 | 3900 | -1 | 32D6 |
| 235 | MAT5 | 3 | MPT | 0 | 4 | 8 | 198 | 1 | 2203 | 22 | S1 | 4000 | -1 | 32E1 |
| 236 | PHBDY | 2 | EPT | 0 | 4 | 8 | 350 | 1 | 2502 | 25 | S1 | 5100 | -1 | 32E2 |
| 237 | MATT4 | 3 | MPT | 0 | 4 | 8 | 37 | 1 | 2303 | 23 | S1 | 3950 | -1 | 32E3 |
| 238 | MATT5 | 3 | MPT | 0 | 4 | 8 | 37 | 1 | 2403 | 24 | S1 | 4050 | -1 | 32E4 |
| 239 | QBOY1 | 9 | GEOM3 | 0 | -4 | 9 | 774 | 0 | 4509 | 45 | S4 | 1990 | -1 | 32E5 |
| 240 | QBDY2 | 9 | GEOM3 | 0 | 4 | 8 | 350 | 0 | 4909 | 49 | S1 | 5150 | -1 | 32E6 |
| 241 | QVECT | 9 | GEOM3 | 0 | -4 | 16 | -1 | 0 | 5009 | 50 | S1 | 5200 | -1 | 33A1 |
| 242 | QVØL | 9 | GEOM3 | 0 | -4 | 9 | 774 | 0 | 5209 | 52 | S1 | 1990 | -1 | 33A2 |
| 243 | RADLST | 14 | MATPØØL | 0 | -4 | 16 | -1 | 0 | 2014 | 20 | S1 | 5250 | -1 | 33A3 |
| 244 | RADMTX | 14 | MATPØØL | 0 | -4 | 8 | -1 | 0 | 3014 | 30 | S3 | 1400 | -1 | 33A4 |
| 245 | SAME | 10 | GEOM4 | 0 | -4 | 10 | -1 | 0 | 7810 | 78 | S5 | 4600 | -1 | 33A5 |
| 246 | SAME1 | 10 | GEOM4 | 0 | -8 | 9 | -1 | 0 | 7910 | 79 | S5 | 5 | -1 | 33A6 |
| 247 | INPUT | 11 | GEOM5 | 0 | 17 | 17 | -1 | 0 | 1310 | 13 | S5 | 5 | -1 | 33B1 |
| 248 | ØUTPUT | 11 | GEOM5 | 0 | 17 | 17 | -1 | 0 | 1410 | 14 | S5 | 5 | -1 | 33B2 |
| 249 | CQDMEM1 | 8 | GEOM2 | 0 | 8 | 12 | 325 | 0 | 2008 | 20 | S1 | 3460 | -1 | 33B3 |
| 250 | PQDMEM1 | 2 | EPT | 0 | 4 | 8 | 237 | 0 | 2202 | 22 | S1 | 3000 | -1 | 33B4 |
| 251 | CIHEX1 | 8 | GEOM2 | 0 | 12 | 16 | 951 | 1 | 7108 | 71 | S5 | 5000 | -1 | 33B5 |
| 252 | CIHEX2 | 8 | GEOM2 | 0 | 24 | 28 | 951 | 1 | 7208 | 72 | S5 | 5100 | -1 | 33B6 |
| 253 | CIHEX3 | 8 | GEOM2 | 0 | 36 | 40 | 951 | 1 | 7308 | 73 | S5 | 5200 | -1 | 33C1 |
| 254 | PIHEX | 2 | EPT | 0 | 4 | 12 | 981 | 1 | 7002 | 70 | S5 | 5300 | -1 | 33C2 |
| 255 | PLØAD3 | 9 | GEOM3 | 0 | 8 | 12 | 949 | 0 | 7109 | 71 | S5 | 5400 | -1 | 33C3 |
| 256 | SPCD | 10 | GEOM4 | 0 | 4 | 8 | 101 | 0 | 5110 | 51 | S1 | 1600 | -1 | 33C4 |
| 257 | CYJØIN | 10 | GEOM4 | 0 | -4 | 16 | -1 | 0 | 5210 | 52 | S1 | 5240 | -1 | 33C5 |
| 258 | CNGRNT | 8 | GEOM2 | 0 | -4 | 16 | -1 | 0 | 5008 | 50 | S1 | 5245 | -1 | 33C6 |
| 259 | CQDMEM2 | 8 | GEOM2 | 0 | 8 | 12 | 325 | 0 | 5308 | 53 | S1 | 3460 | -1 | 33D1 |
| 260 | PQDMEM2 | 2 | EPT | 0 | 4 | 8 | 237 | 0 | 5302 | 53 | S1 | 3000 | -1 | 33D2 |
| 261 | CQDMEM3 | 8 | GEOM2 | 0 | 8 | 12 | 325 | 0 | 5408 | 54 | S1 | 3460 | -1 | 33D3 |
| 262 | PQDMEM3 | 2 | EPT | 0 | 4 | 8 | 237 | 0 | 5402 | 54 | S1 | 3000 | -1 | 33D4 |
| 263 | CAERO1 | 4 | EDT | 0 | 16 | 16 | 39 | 1 | 3002 | 30 | S5 | 6400 | -1 | 33D5 |
| 264 | PAERO1 | 4 | EDT | 0 | 4 | 8 | 803 | 1 | 3102 | 31 | S5 | 6500 | -1 | 33D6 |
| 265 | AERØ | 4 | EDT | 0 | 8 | 12 | 2 | 0 | 3202 | 32 | S5 | 6600 | -1 | 33E1 |
| 266 | SPLINE1 | 4 | EDT | 0 | 8 | 12 | 42 | 1 | 3302 | 33 | S5 | 6700 | -1 | 33E2 |
| 267 | SPLINE2 | 4 | EDT | 0 | 12 | 16 | 1025 | 1 | 3402 | 34 | S5 | 6800 | -1 | 33E3 |
| 268 | SET1 | 4 | EDT | 0 | -4 | 16 | -1 | 0 | 3502 | 35 | S1 | 5300 | -1 | 33E4 |
| 269 | SET2 | 4 | EDT | 0 | 4 | 8 | 197 | 0 | 3602 | 36 | S5 | 5600 | -1 | 33E5 |
| 270 | MKAERO2 | 4 | EDT | 0 | 4 | 8 | 805 | 0 | 3702 | 37 | S5 | 5700 | -1 | 33E6 |
| 271 | MKAERO1 | 4 | EDT | 0 | 16 | 16 | 805 | 0 | 3802 | 38 | S5 | 5800 | -1 | 41A1 |
| 272 | FLUTTER | 4 | EDT | 0 | 10 | 14 | 1005 | 1 | 3902 | 39 | S5 | 5900 | -1 | 41A2 |
| 273 | AEFACT | 4 | EDT | 0 | -4 | 16 | -1 | 1 | 4002 | 40 | S3 | 1415 | -1 | 41A3 |
| 274 | FLFACT | 4 | EDT | 0 | -4 | 16 | -1 | 1 | 4102 | 41 | S3 | 1415 | -1 | 41A4 |
| 275 | CBARAO | 8 | GEOM2 | 0 | 9 | 13 | -1 | 1 | 4001 | 40 | S5 | 6100 | -1 | 41A5 |
| 276 | PLINIT | 3 | MPT | 0 | -9 | 14 | -1 | 0 | 304 | 3 | S5 | 6200 | -1 | 41A6 |
| 277 | PØPT | 3 | MPT | 0 | 9 | 13 | 1017 | 0 | 404 | 4 | S5 | 6300 | -1 | 41B1 |
| 278 | PLØADX | 9 | GEOM3 | 0 | 8 | 12 | 1037 | 0 | 7001 | 70 | S5 | 6900 | -1 | 41B2 |
| 279 | CRIGD1 | 10 | GEOM4 | -2 | -4 | 48 | -1 | 1 | 5310 | 53 | S3 | 2010 | -1 | 41B3 |
| 280 | CQUADTS | 8 | GEOM2 | 0 | 8 | 20 | 1045 | 1 | 4108 | 41 | S4 | 2020 | -1 | 41B4 |
| 281 | PQUADTS | 2 | EPT | 0 | 8 | 12 | 277 | 1 | 2402 | 24 | S4 | 2030 | -1 | 41B5 |
| 282 | CTRIATS | 8 | GEOM2 | 0 | 8 | 20 | 1047 | 1 | 5908 | 59 | S4 | 2021 | -1 | 41B6 |
| 283 | PTRIATS | 2 | EPT | 0 | 8 | 12 | 277 | 1 | 2302 | 23 | S4 | 2030 | -1 | 41C1 |
| 284 | CRIGD2 | 10 | GEOM4 | -2 | -6 | 48 | -1 | 1 | 5410 | 54 | S3 | 2060 | -1 | 41C2 |
| 285 | CTRIAAX | 15 | AXIC | -2 | 4 | 8 | 313 | 1 | 7012 | 70 | S3 | 2111 | 0 | 41C3 |
| 286 | PTRIAAX | 2 | EPT | -2 | 4 | 24 | 349 | 1 | 7032 | 85 | S3 | 2030 | 0 | 41C4 |
| 287 | CTRAPAX | 15 | AXIC | -2 | 4 | 8 | 325 | 1 | 7042 | 74 | S3 | 2040 | 0 | 41C5 |
| 288 | PTRAPAX | 2 | EPT | -2 | 4 | 24 | 349 | 1 | 7052 | 95 | S3 | 2030 | 0 | 41C6 |
| 289 | VIEW | 2 | EPT | 0 | 4 | 8 | 326 | 1 | 2606 | 26 | S1 | 5175 | 0 | 41D1 |
| 290 | VARIAN | 4 | EDT | 0 | -4 | 16 | -1 | 0 | 4202 | 42 | S3 | 1410 | 0 | 41D2 |
| 291 | CSP | 10 | GEOM4 | 0 | -4 | 8 | -1 | 0 | 3291 | 91 | S3 | 2910 | -1 | 41D3 |
| 292 | STREAML1 | 4 | EDT | 0 | -4 | 9 | -1 | 1 | 3292 | 92 | S3 | 2920 | -1 | 41D4 |
| 293 | STREAML2 | 4 | EDT | 0 | 12 | 16 | 45 | 1 | 3293 | 93 | S3 | 3010 | -1 | 41D5 |

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX GENERATOR)

Each combination has four influence quadrants (upper left, upper right, lower left, lower right), so these routines must be called four times for each element and then the result summed before SUBP returns. Subroutine INCRØ uses subroutines TKER, IDF1, and IDF2 to compute the final result.

The flow for Section two of the Doublet Lattice method is as follows. Subroutine DLPT2 prepares all the computations necessary. DLPT2 reads the record of ACPT and then loops through each box packing out a column of SKJ, DIJK, and D2JK for each box.

The row position of each pair of values for a column is $2*(\text{box number}-1) + 1$. Successive rows of SKJ have the following form:

$$SKJ \rightarrow \left[\frac{2.0 * EE_{\text{strip}} * DELX_{\text{box}}}{EE_{\text{strip}} * DELX_{\text{box}}^2 / 2.0} \right] \quad (1)$$

Successive rows of DIJK have the following form:

$$DIJK \rightarrow \left[\frac{0.0}{1.0} \right] \quad (2)$$

Successive rows of D2JK have the following form:

$$D2JK \rightarrow \left[\frac{-2.0/REFC}{DELX_{\text{box}}/2.0*REFL} \right] \quad (3)$$

4.114.7.2 Compressor Blade Method

The flow for Section one of the compressor blade method is as follows. Subroutine AMGB1 is the driver for this method. It reads in the ACP record for this method and locates reference parameters from the reference streamline on the

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX GENERATOR)

blade. If there is enough core available, it calls AMGB1A to output one matrix of the AJJL list. When AMGB1A is through, AMGB1 bumps NR0W and returns.

Subroutine AMGB1A outputs a portion of the AJJL matrix for each streamline on the compressor blade. Each streamline may be subsonic, transonic or supersonic, depending on the Mach number for that streamline. Subroutine AMGB1B calculates terms for subsonic streamlines. Subroutine AMGB1C calculates terms for supersonic streamlines and subroutine AMGB1D calculates terms for transonic streamlines.

Each submatrix of AJJL corresponds to a blade streamline and is of order NSTNS X NSTNS, where NSTNS is the number of computing stations on the blade. The submatrices are located along the diagonal of AJJL. AJJL transpose is output.

The flow for Section two of the compressor blade method is as follows. Subroutine AMGB2 prepares all the computations necessary. It reads the ACPT record and locates the reference streamline parameters. Subroutine AMGB2A is called to calculate the W factor and matrix $[F^{-1}]$ for each streamline. AMGB2 outputs the NSTNS X NSTNS submatrix for each streamline to the [SKJ] and [D1JK] matrices. Each submatrix of [SKJ] and [D1JK] has the following form:

$$[SKJ] = W \cdot [F^{-1}]^T$$

and

$$[D1JK] = [F^{-1}]^T$$

The [D2JK] matrix is null.

4.114.8 Subroutines

Besides the module driver AMG, the subroutines are divided into groups by method.

For the Doublet Lattice method the subroutines are:

DLAMG, GEND, DPPS, SUBP, SNPDF, INCR0, IKER, IDF1, IDF2, and DLPT2.

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX GENERATOR)

4.114.8.1 Subroutine Name: AMG

1. Entry Point: AMG
2. Purpose: Module driver for AMG - see description above.
3. Calling Sequence: CALL AMG

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX DISTRIBUTOR)

DIIR = output - real part of nonplanar integral contribution

DIJI = output - imaginary part of nonplanar integral contribution

4.114.8.11 Subroutine Name: DLPT2

1. Entry Point: DLPT2
2. Purpose: To output the Doublet Lattice parts for matrices SKJ, DIJK, and D2JK.
3. Calling Sequence: CALL DLPT2 (INPUT, SKJ, WIJK, W2JK)

INPUT = GINØ number for ACPT

SKJ = GINØ number for SKJ

WIJK = GINØ number for DIJK

W2JK = GINØ number for D2JK

4.114.8.12 Subroutine Name: AMGB1

1. Entry Point: AMGB1
2. Purpose: Driver for the compressor blade method.
3. Calling Sequence: CALL AMGB1 (INPUT, MATØUT)

INPUT = GINØ file number for ACPT

MATØUT = GINØ file number for AJJL

4.114.8.13 Subroutine Name: AMGB1A

1. Entry Point: AMGB1A
2. Purpose: Output all the columns of AJJL associated with a record of ACPT.

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX DISTRIBUTOR)

3. Calling Sequence: CALL AMGB1A (INPUT, MATOUT, AJJ, AJJT, TSPNX, TAMACH, TREFD)

INPUT = GINØ file number of ACPT

MATOUT = GINØ file number of AJJL

AJJ = Storage for AJJL submatrices - complex

AJJT = Storage for one column of AJJL

TSPNX = Stores position of transonic submatrix in AJJL for a particular transonic streamline

TAMACH = Stores Mach numbers of transonic streamlines

TREFD = Stores reduced frequencies of transonic streamlines

4.114.8.14 Subroutine Name: AMGB1B

1. Entry Point: AMGB1B
2. Purpose: Calculates AJJL terms for subsonic streamlines.
3. Calling Sequence: CALL AMGB1B (AJJL)

AJJL = Location to put subsonic AJJL submatrix for this streamline

4.114.8.15 Subroutine Name: AMGB1C

1. Entry Point: AMGB1C
2. Purpose: Calculates AJJL terms for supersonic streamlines.
3. Calling Sequence: CALL AMGB1C (AJJL)

AJJL = Location to put supersonic AJJL submatrix for this streamline

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX DISTRIBUTOR)

4.114.8.16 Subroutine Name: AMGB1D

1. Entry Point: AMGB1D
2. Purpose: Calculates AJJL terms for transonic streamlines.
3. Calling Sequence: CALL AMGB1D (AJJL, T~~SP~~ONX, TAMACH, TREF)

AJJL = AJJL submatrices for all subsonic and supersonic streamlines.
It also contains space for transonic submatrices.

T~~SP~~ONX = (integer) - vector - non-zero indicates transonic streamline
zero if known streamline

TAMACH = Vector of streamline Mach numbers

TREF = Vector of streamline reduced frequencies

4.114.8.17 Subroutine Name: INTERT

1. Entry Point: INTERT
2. Purpose: To linearly interpolate by Mach number a transonic general Air Force matrix given two known streamline matrices.
3. Calling Sequence: CALL INTERT (NL, NL1, NL2, NM, AJJ, TA)

NL = Streamline number of unknown transonic

NL1, NL2 = Two known streamlines

NM = Size of matrix in AJJ = $2 * NSTNS * NSTNS$

AJJ = Contains all generalized Air Force matrices for all
streamlines

TA = Vector of streamline Mach numbers

4.114.8.18 Subroutine Names: SUBA, SUBB, SUBC, SUBD, ALAMDA, AKP2, AKAPPA, DLKAPM, ASYCON, AKAPM, DRKAPM

1. Entry Points: The same as name
2. Purpose: Called by AMGB1C

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX DISTRIBUTOR)

4.114.8.19 Subroutine Name: GAUSS

1. Entry Point: GAUSS
2. Purpose: Equation Solver used by AMGB1B.
3. Calling Sequence: CALL GAUSS (A, N, NL)

4.114.8.20 Subroutine Name: AMGB2

1. Entry Point: AMGB2
2. Purpose: To output the compressor blade parts for matrices SKJ, DIJK, and D2JK.
3. Calling Sequence: CALL AMGB2 (INPUT, SKJ, WIJK, W2JK)

INPUT = GINØ file number for ACTP
SKJ = GINØ file number for SKJ
WIJK = GINØ file number for DIJK
W2JK = GINØ file number for D2JK

4.114.8.21 Subroutine Name: AMGB2A

1. Entry Point: AMGB2A
2. Purpose: Calculate $[F^{-1}]$ matrix and W factor used in the generation of SKJ and DIJK.
3. Calling Sequence: CALL AMGB2A (INPUT, FMAT, XYZB, INDEX, RADII, WFACT, NLINE)

INPUT = GINØ file number of ACPT
FMAT = Location for $[F^{-1}]$ matrix
XYZB = Location for basic coordinates of nodes on streamline
INDEX = Work storage for INVERS
WFACT = Factor for output

NLINE = Number of streamlines

RADII = Streamline radius

4.114.9 Design Requirements

For Section one, three buffers are allocated at the bottom of core. For Section two, four buffers are allocated at the bottom of core. Each method may have its own open core common block but they must not overlap these buffers.

4.114.9.1 Communication Common Blocks

AMGMN

Words

- | | | | |
|-----|-------|---|-----------------------------|
| 1-7 | MCB | - Trailer for AJJL | |
| 8 | NRØW | - Last row number output for any method on AJJL | |
| 9 | ND | - Y - symmetry flag | |
| 10 | NE | - Z - symmetry flag | 1 record of AERØ |
| 11 | REFC | - Reference chord | |
| 12 | FMACH | - Mach number | |
| 13 | REFK | - Reduced frequency | Pairs from 2 record of AERØ |

MODULE FUNCTIONAL DESCRIPTIONS

4.114.9.3 Common Blocks for Compressor Blade Method

/BAMG1L/ and /BAMG2L/

Words:

- | | | |
|----|--------|---|
| 1 | IREF | - Reference streamline number |
| 2 | MINMAC | - Parameter MINMACH |
| 3 | MAXMAC | - Parameter MAXMACH |
| 4 | NLINES | - Number of streamlines on blade |
| 5 | NSTNS | - Number of stations on blade |
| 6 | REFSTG | - Reference blade stagger angle |
| 7 | REFCRD | - Reference blade chord |
| 8 | REFMAC | - Reference Mach number |
| 9 | REFDEN | - Reference density |
| 10 | REFVEL | - Reference velocity |
| 11 | REFFLØ | - Reference flow angle |
| 12 | SLN | - Streamline number |
| 13 | NSTNSX | - Number of stations on streamline |
| 14 | STAGER | - Blade stagger angle |
| 15 | CHØRD | - Blade chord |
| 16 | RADIUS | - Radius of streamline |
| 17 | BSPACE | - Blade spacing |
| 18 | MACH | - Relative flow Mach number at blade leading edge |
| 19 | DEN | - Gas density at blade leading edge |
| 20 | VEL | - Relative flow velocity at blade leading edge |
| 21 | FLØWA | - Relative flow angle at blade leading edge |
| 22 | AMACH | - Internal Mach number |
| 23 | REDF | - Internal reduced frequency |
| 24 | BLSPC | - Internal blade spacing |
| 25 | AMACHR | - Internal reference Mach number |
| 26 | TSØNIC | - Transonic indicator |

MODULE FUNCTIONAL DESCRIPTIONS

4.115.7.3 Subroutine AMPC

Calculate (or find) Q_{jh} if it is needed. It will be needed if either (a) Q_{jh} is to be output, or (b) Q_{hh} is to be output and is not found on the scratch file. The Q_{jh} and Q_{hh} are not to be output only when their output data blocks are purged. If Q_{jh} can be found on a scratch file, get it from there; otherwise, it must be calculated. First, check to see if $D_{jh}(k)$ has been calculated for the present k . If not, find it by

$$[D_{jh}] = [D_{jh}^{(1)}] + i k [D_{jh}^{(2)}] \quad (6)$$

and save for possible later use. Next, solve for Q_{jh} . The algebra included here will be theory dependent. The header record of AJJL will specify aerodynamic groups (see Section 4.115.7.5). Retrieve the submatrix $[A_{jj}]$ from AJJL and transpose it. If there is more than one group, D_{jh} must be unpacked into row groups. For each group, solve for $[Q_{jh}]$, then pack the groups. For Doublet Lattice method,

$$[Q_{jh}]_{\text{group}} = [A_{jj}^T]_{\text{group}}^{-1} [D_{jh}]_{\text{group}} \quad (7)$$

For the compressor blade method, retrieve the submatrix $[A_{jj}]$ from AJJL and compute

$$[Q_{jh}] = [A_{jj}^T]^T [D_{jh}]$$

There are no groups for the compressor blade method.

For other methods (including Doublet Lattice with bodies), the algebra will be specified at a later time, and the code will have to be added to the module.

4.115.7.4 Subroutine AMPD

Calculate (or find) $[Q_{hh}]$ if it is needed. It will be needed unless the output data block is purged. If $[Q_{hh}]$ can be found on a scratch file, get it there; otherwise, it must be calculated. If it must be calculated $[Q_{jh}]$ will be available. To compute $[Q_{hh}]$

$$[Q_{kh}] = [S_{kj}][Q_{jh}] \quad (8)$$

$$[Q_{ih}] = [G_{ki}]^T [Q_{kh}] \quad (9)$$

$$[Q_{hh}] = \text{Merge} \left[\frac{Q_{ih}}{Q_{eh}} \right] \quad (10)$$

where $[Q_{eh}]$ is zero. Note that this requires only an update of $[Q_{in}]$'s trailer.

Check the time. If $[Q_{jh}]$ and $[Q_{hh}]$ were calculated (rather than found), then the time per calculation can be found. If the time per calculation is known and it is not enough (with a 10% margin), no more loops should be attempted.

MODULE FUNCTIONAL DESCRIPTIONS

4.115.8 Subroutines

Numerous utility subroutines are used by the functional phases as shown below.

| <u>AMPA</u> | <u>AMPB</u> | <u>AMPC</u> | <u>AMPD</u> |
|-------------|-------------|-------------|-------------|
| CYCT2B | CALCV | CYCT2B | CYCT2B |
| | SSG2B | SSG2C | SSG2B |
| | MERGED | CFACR. | |
| | PARTN | CFBSØR | |
| | | FILSWI | |
| | | TRANP1 | |
| | | SSG2B | |

4.115.8.1 Subroutine Name: AMPA

1. Entry Point: AMPA
2. Purpose: To provide a scenario for later phases and to prepare for use of the appended output files.
3. Calling Sequence: CALL AMPA (AERØ, QJHL, QHHL, AJJL, QHHLØ, QJHLØ, INDEX, IMAX, IANY)
AERØ, QJHL, QHHL, and AJJL are the GINØ file numbers of their respective data blocks.
QHHLØ and QJHLØ are the GINØ file numbers of two scratch files to hold valid submatrices from QHHL and QJHL on restart.
INDEX is the GINØ file number of the scenario data block. Its contents are as follows:

| <u>Record No.</u> | <u>Word</u> | <u>Contents</u> |
|-------------------|-------------|---|
| 0 | 1 | Header |
| 1 | 1 | M column number |
| | 2 | K column number |
| | 3 | AJJL column number |
| | 4 | QHHLØ column number (0 implies recompute) |
| ... | | |

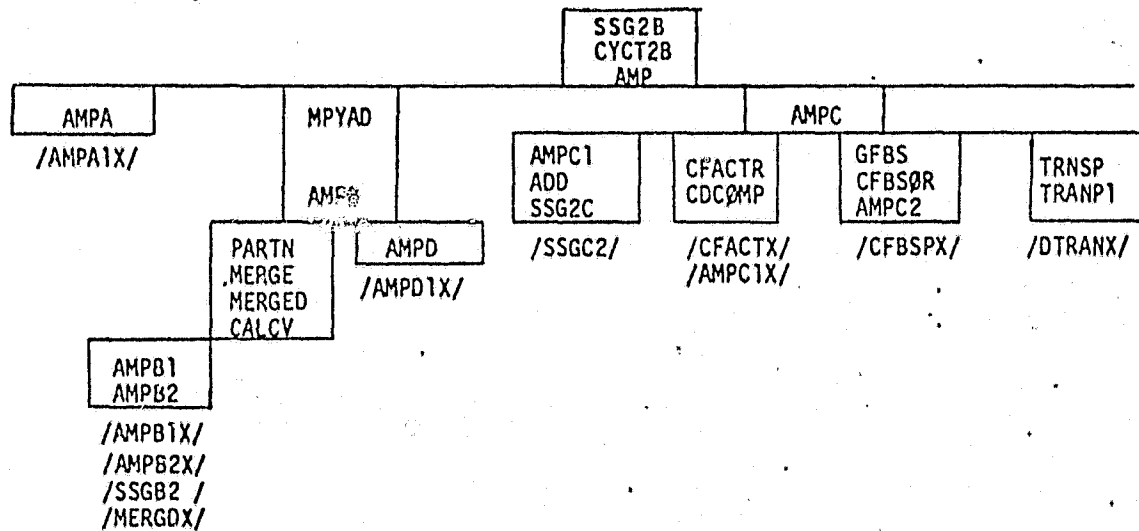
FUNCTIONAL MODULE AMP (AERODYNAMIC MATRIX PROCESSOR)

Open core AMPA1X is laid out as follows:

| Contents | Length | Pointer |
|----------------------------------|--------|---------|
| NCØLJ | 1 | |
| NSUB | 1 | 1AJJL |
| m-k pairs from AJJL Header | 2*NSUB | |
| m-k pairs from AERØ | 2*IMAX | 1AERØ |
| NCØLH | 1 | |
| NØH | 1 | |
| m-k pairs from old QHH | 2*NQHH | 1QHH |

2 Buffers

3. Overlay Considerations: To maximize open core, AMP could look as follows:



FUNCTIONAL MODULE FA2 (FLUTTER ANALYSIS - PHASE 2)

4.117 FUNCTIONAL MODULE FA2 (FLUTTER ANALYSIS - PHASE 2)

4.117.1 Entry Point: FA2

4.117.2 Purpose

To collect data for reduction and presentation for each loop through the configuration parameters.

4.117.3 DMAP Calling Sequence

FA2 PHIH,CLAMA,FSAVE / PHIHL,CLAMAL,CASEYY,ØVG / V,N,TSTART / C,Y,VREF
 =1.0 / C,Y,PRINT=YES \$

4.117.4 Input Data Blocks

PHIH - Complex eigenvectors - h set, modal formulations.

CLAMA - Complex eigenvalue output table.

FSAVE - Flutter storage save table.

Note: No input data block may be purged.

4.117.5 Output Data Blocks

PHIHL - Appended complex mode shapes - h set.

CLAMAL - Appended complex eigenvalue output table.

CASEYY - Appended case control data table.

ØVG - Output aeroelastic curve requests (V-g or V-f).

Notes:

1. No output data block may be purged.
2. All output data blocks are read (DMAP attribute APPEND) on subsequent calls (FLØØP from FSAVE ≠ 1).

4.117.6 Parameters

TSTART - Integer-input/output-no default value. On input TSTART is the CPU time at the start of the DMAP flutter loop. On output TSTART will be -1 if there is insufficient time for another DMAP loop.

VREF - Real-user input-default = 1.0. V_{out} will be scaled by VREF:

$$V_{out} = V/V_{ref}$$

PRINT - BCD-user input-default = YES. If PRINT = NO, no flutter summary will be printed.

For YES the wing flutter summary will be printed.

For YESB the blade summary will be printed.

MODULE FUNCTIONAL DESCRIPTIONS

4.117.7 Method

The primary purpose of module FA2 is to gather data for reduction and presentation. The header record of FSAVE will contain the METHOD. Only the k-method is defined. This module is near the end of a DMAP loop. Its output files PHIHL, CLAMAL, CASEYY AND ØVG are appended for each entry. On the first pass, special code must be executed to initiate the files.

The complex eigenvalues λ have been found by module CEAD. These should have been sorted by $\text{Im}(\lambda)$ increasing. Only use the first "NVALUE" modes. The quantities that need to be computed are:

MACH can be interblade

phase angle SIGMA for

compressor blade flutter

analysis.

$$V_{\text{out}} = \text{Im}(\lambda)/V_{\text{ref}}$$

$$g = \begin{cases} (2.0) \text{Re}(\lambda)/\text{Im}(\lambda) & \text{if } \text{Im}(\lambda) \neq 0 \\ 0 & \text{if } \text{Im}(\lambda) = 0 \end{cases}$$

$$f = k \text{Im}(\lambda)/2\pi b_{\text{ref}}$$

$$V_{\text{mach}} = V_{\text{sound}} m/V_{\text{ref}}$$

The values of the parameter FLØØP, m, k, b_{ref} and NVALUE are found in the file FSAVE. A printer output is prepared the format is:

FLUTTER SUMMARY (K METHOD)

| LØØP | DENRATIO | KFREQ | 1./KFREQ | MACH | MACH*VSOUND | VEL(K) | G(DAMP) | FREQ |
|-------|----------|-------|----------|------|----------------------|------------------|---------|------|
| I | R | R | R | R | R | R | R | R |
| FLØØP | p | K | 1./K | m | M*V _{sound} | V _{out} | g | f |

The PHIHL, CASEYY and CLAMAL data blocks are created by appending the PHIHL, CASEYY and CLAMA data blocks. (Note: Some method of mode selection is expected to be added here. At present, we will rely upon ALLMAT to select vectors.)

The CASEYY data block is for SDR2 and PLØT. It must keep in step with the append vectors. m, k, p and FLØØP will be added to the LABEL

FUNCTIONAL MODULE FA2 (FLUTTER ANALYSIS - PHASE 2)

The ØVG data block is appended each time through the LØØP. This will be used to create V-g or V-f plots. m, k, p and FLØØP will be added to the LABEL.

4.117.8 Subroutines

Utility routine CYCT2B is called.

4.117.9 Design Requirements

Open core for FA2 is at /FA2X/.

4.117.10 Diagnostic Messages

The following messages may occur: 3001, 3002, 3003, 3007, 3008 and 3045. Only 3045 is a user message. It indicates that the DMAP loop was not completed by exhausting the configuration parameters but rather by a time-to-go failure.

RIGID FORMAT RESTART TABLES

Displacement Approach Rigid Formats

| <u>Solution Number</u> | <u>Rigid Format Name</u> | <u>Section</u> |
|------------------------|--|----------------|
| 1 | STATICS | 10.2 |
| 2 | INERTIA RELIEF | 10.3 |
| 3 | MØDES or NØRMAL MØDES or REAL EIGENVALUES | 10.4 |
| 4 | DIFFERENTIAL STIFFNESS | 10.5 |
| 5 | BUCKLING | 10.6 |
| 6 | PIECEWISE LINEAR | 10.7 |
| 7 | DIRECT CØMPLEX EIGENVALUES | 10.8 |
| 8 | DIRECT FREQUENCY RESPONSE | 10.9 |
| 9 | DIRECT TRANSIENT RESPONSE | 10.10 |
| 10 | MØDAL CØMPLEX EIGENVALUES | 10.11 |
| 11 | MØDAL FREQUENCY RESPONSE | 10.12 |
| 12 | MØDAL TRANSIENT RESPONSE | 10.13 |
| 13 | NØRMAL MØDES ANALYSIS WITH DIFFERENTIAL STIFFNESS | 10.14 |
| 14 | STATICS CYCLIC SYMMETRY | 10.15 |
| 15 | MØDES CYCLIC SYMMETRY | 10.16 |
| 16 | STATIC AEROTHERMOELASTIC ANALYSIS WITH DIFFERENTIAL STIFFNESS | 10.21 |

Heat Transfer Approach Rigid Formats

| <u>Solution Number</u> | <u>Rigid Format Name</u> | <u>Section</u> |
|------------------------|--------------------------|----------------|
| 1 | STATICS | 10.17 |
| 3 | STEADY STATE | 10.18 |
| 9 | TRANSIENT | 10.19 |

Aeroelastic Approach Rigid Format

| <u>Solution Number</u> | <u>Rigid Format Name</u> | <u>Section</u> |
|------------------------|---|----------------|
| 9 | COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS | 10.22 |
| 10 | MODAL FLUTTER ANALYSIS | 10.20 |

Table 1 Rigid Format Index Table

STATIC AEROELASTIC ANALYSIS

10.21 RESTART TABLES FOR STATIC AEROELASTIC ANALYSIS

10.21.1 Bit Positions for Card Name Restart Table

| <u>Card Name</u> | <u>Bit Pos.</u> | <u>Card Name</u> | <u>Bit Pos.</u> | <u>Card Name</u> | <u>Bit Pos.</u> |
|------------------|-----------------|------------------|-----------------|------------------|-----------------|
| AXIC | 1 | CQOPLT | 2 | PELAS | 6 |
| AXIF | 1 | CQUAD1 | 2 | PHASS | 7 |
| CELAS1 | 1 | CQUAD2 | 2 | MAT1 | 8 |
| CELAS2 | 1 | CQUADTS | 2 | MAT2 | 8 |
| CELAS3 | 1 | CROD | 2 | MAT3 | 8 |
| CELAS4 | 1 | CSHEAR | 2 | MAT11 | 8 |
| CHASS1 | 1 | CTETRA | 2 | MAT12 | 8 |
| CHASS2 | 1 | CTORDRG | 2 | MAT13 | 8 |
| CHASS3 | 1 | CTRAPAX | 2 | TABLEM1 | 8 |
| CHASS4 | 1 | CTRPRG | 2 | TABLEM2 | 8 |
| CORD1C | 1 | CTRISC | 2 | TABLEM3 | 8 |
| CORD1R | 1 | CTRIAL | 2 | TABLEM4 | 8 |
| CORD1S | 1 | CTRIA2 | 2 | TEMPMT\$ | 8 |
| CORD2C | 1 | CTRIAAX | 2 | TEMPMX\$ | 8 |
| CORD2R | 1 | CTRIARG | 2 | AXISYM\$ | 9 |
| CORD2S | 1 | CTRIATS | 2 | CRIGD1 | 9 |
| GRDSET | 1 | CTRMEM | 2 | CRIGD2 | 9 |
| GRID | 1 | CTRPLT | 2 | MPC | 9 |
| GRIDB | 1 | CTUBE | 2 | MPCADD | 9 |
| POINTAX | 1 | CTWIST | 2 | MPCAX | 9 |
| RINGAX | 1 | CWEDGE | 2 | MPC\$ | 9 |
| RINGFL | 1 | PBAR | 3 | SPC | 10 |
| SECTAX | 1 | PCONEAX | 3 | SPC1 | 10 |
| SEQGP | 1 | PDUM1 | 3 | SPCADD | 10 |
| SPGINT | 1 | PDUM2 | 3 | SPCAX | 10 |
| ADUM1 | 2 | PDUM3 | 3 | SPC\$ | 10 |
| ADUM2 | 2 | PDUM4 | 3 | ASET | 11 |
| ADUM3 | 2 | PDUM5 | 3 | ASET1 | 11 |
| ADUM4 | 2 | PDUM6 | 3 | OMIT | 11 |
| ADUM5 | 2 | PDUM7 | 3 | OMIT1 | 11 |
| ADUM6 | 2 | PDUM8 | 3 | OMITAX | 11 |
| ADUM7 | 2 | PDUM9 | 3 | SUPAX | 12 |
| ADUM8 | 2 | PIHEX | 3 | SUPORT | 12 |
| ADUM9 | 2 | PQDMEM | 3 | TEMP | 13 |
| BAROR | 2 | PQDMEM1 | 3 | TEMPAX | 13 |
| CBAR | 2 | PQDMEM2 | 3 | TEMPO | 13 |
| CCONEAX | 2 | PQDMEM3 | 3 | TEMPP1 | 13 |
| CDUM1 | 2 | PQOPLT | 3 | TEMPP2 | 13 |
| CDUM2 | 2 | PQUAD1 | 3 | TEMPP3 | 13 |
| CDUM3 | 2 | PQUAD2 | 3 | TEMPRB | 13 |
| CDUM4 | 2 | PQUADTS | 3 | WTHASS | 14 |
| CDUM5 | 2 | PROD | 3 | GRDPNT | 15 |
| CDUM6 | 2 | PSHEAR | 3 | PLOTEL | 16 |
| CDUM7 | 2 | PTORDRG | 3 | IRES | 17 |
| CDUM8 | 2 | PTRAPAX | 3 | PLOTS | 18 |
| CDUM9 | 2 | PTRISC | 3 | POUT\$ | 19 |
| CHEXA1 | 2 | PTRIAL | 3 | LOOP\$ | 22 |
| CHEXA2 | 2 | PTRIA2 | 3 | LOOP1\$ | 23 |
| CIHEX1 | 2 | PTRIAAX | 3 | COUPHASS | 24 |
| CIHEX2 | 2 | PTRIATS | 3 | CPBAR | 24 |
| CIHEX3 | 2 | PTRMEM | 3 | CPQDPLT | 24 |
| CONROD | 2 | CTRPLT | 3 | CPQUAD1 | 24 |
| CQDNEM | 2 | CTUBE | 3 | CPQUAD2 | 24 |
| CQDNEM1 | 2 | CTWIST | 3 | CPROD | 24 |
| CQDNEM2 | 2 | GENEL | 4 | CPTRISC | 24 |
| CQDNEM3 | 2 | CONM1 | 5 | CPTRIAL | 24 |
| | | CONM2 | 5 | | |

RIGID FORMAT RESTART TABLES

Card Name Bit Pos.

| | |
|----------|----|
| CPTRIA2 | 24 |
| CPTPLT | 24 |
| CPTUBE | 24 |
| CSP\$ | 25 |
| STREAML1 | 26 |
| DTI | 26 |
| APRESS | 26 |
| ATEMP | 26 |
| SIGN | 26 |
| ZORIGN | 26 |
| FXCOOR | 26 |
| FYCOOR | 26 |
| FZCOOR | 26 |
| STREAML | 27 |
| PGEOM | 27 |
| KTOUT | 28 |
| DEFORM | 59 |
| DEFORM\$ | 59 |
| LOADS | 59 |
| RFORCE\$ | 59 |
| SPCD | 59 |
| FORCE | 60 |
| FORCE1 | 60 |
| FORCE2 | 60 |
| FORCEAX | 60 |
| LOAD | 60 |
| MOMAX | 60 |
| MOMENT | 60 |
| MOMENT1 | 60 |
| MOMENT2 | 60 |
| PLOAD | 60 |
| PLOAD1 | 60 |
| PLOAD2 | 60 |
| PLOAD3 | 60 |
| PRESAX | 60 |
| SLOAD | 60 |
| GRAV | 61 |
| RFORCE | 61 |
| TEMPLOS | 62 |

STATIC AEROELASTIC ANALYSIS

10.21.2 Bit Positions for File Name Restart Table

| File Name | Bit Pos. | File Name | Bit Pos. |
|-----------|----------|-----------|----------|
| OGPDT | 94 | PG1 | 111 |
| CSTM | 94 | QG | 111 |
| EQEXIN | 94 | UGV | 111 |
| GPDY | 94 | OEFI | 112 |
| GPL | 94 | OESI | 112 |
| SIL | 94 | OPG1 | 112 |
| ECT | 95 | OQG1 | 112 |
| GPTT | 96 | OUGV1 | 112 |
| SLT | 96 | PUGV1 | 112 |
| EST | 97 | KODICT | 113 |
| GEI | 97 | KDELM | 113 |
| GPECT | 97 | KDGG | 113 |
| GPST | 98 | KDNN | 114 |
| KGGX | 98 | KDFF | 115 |
| MGG | 99 | KDFS | 115 |
| KGG | 100 | KDSS | 115 |
| RG | 101 | KDAA | 116 |
| USET | 101 | KDLL | 117 |
| YS | 101 | KDFS | 117 |
| OGPST | 102 | KDSS | 117 |
| GM | 103 | PBL | 117 |
| KNN | 104 | PBS | 117 |
| KFF | 105 | YBS | 117 |
| KFS | 105 | LALL | 118 |
| KSS | 105 | UBLV | 119 |
| GO | 106 | RUBLV | 119 |
| KAA | 106 | QBG | 120 |
| KOO | 106 | UBGV | 120 |
| LOO | 106 | OEFB1 | 121 |
| LLL | 107 | OESB1 | 121 |
| PG | 108 | OQBG1 | 121 |
| PL | 109 | OUBGV1 | 121 |
| PO | 109 | PUBGV1 | 121 |
| PS | 109 | ELSETS | 122 |
| RULV | 110 | GPSETS | 122 |
| RUOV | 110 | PLTPAR | 122 |
| ULV | 110 | PLTSETX | 122 |
| UQOV | 110 | KDICT | 123 |
| | | KELM | 123 |
| | | MDICT | 123 |
| | | MELM | 123 |
| | | CASECCA1 | 124 |
| | | GEOM3A1 | 124 |
| | | SLTA1 | 125 |
| | | GPTTA1 | 125 |
| | | PGA1 | 126 |
| | | CASECCA | 127 |
| | | GEOM3A | 127 |
| | | SLTA | 128 |
| | | GPTTA | 128 |
| | | PGA | 129 |
| | | FC2 | 131 |
| | | GEOM3B | 131 |
| | | PGNA | 132 |
| | | AUGV | 133 |
| | | PG12 | 134 |

RIGID FORMAT RESTART TABLES

10.21.3 Card Name Restart Table

| DMP Inst. | Bit Position | | | | | |
|--------------|--------------|-----------|-----|----|----|------|
| | 1 | 10 | 20 | 30 | 40 | 50 |
| BEGIN | 123456789 | 123456789 | 234 | | | 9012 |
| GP1 | 1 | | | | | |
| SAVE | 1 | | | | | |
| COND | 1 | | | | | |
| CHKPNT | 1 | | | | | |
| \$SS | | 6 | | | | |
| GP2 | 12 45 | | 6 | | | |
| CHKPNT | 12 45 | | 6 | | | |
| \$SS | | 6 | | | | |
| PARAML | | | 8 | | | |
| \$SS | 7 | | | | | |
| PARAMR | | | | 6 | | |
| PURGE | | | 8 | | | |
| \$SS | 7 | | | | | |
| COND | | | 8 | | | |
| \$SS | 7 | | | | | |
| PLTSET | | | 8 | | | |
| \$SS | 7 | | | | | |
| SAVE | | | 8 | | | |
| \$SS | 7 | | | | | |
| PRTMSG | | | 8 | | | |
| \$SS | 7 | | | | | |
| PARAM | | | 8 | | | |
| \$SS | 7 | | | | | |
| PARAM | | | 8 | | | |
| \$SS | 7 | | | | | |
| COND | | | 8 | | | |
| \$SS | 7 | | | | | |
| PLOT | | | 8 | | | |
| \$SS | 7 | | | | | |
| SAVE | | | 8 | | | |
| \$SS | 7 | | | | | |
| PRTMSG | | | 8 | | | |
| \$SS | 7 | | | | | |
| LABEL | | | 8 | | | |
| \$SS | 7 | | | | | |
| CHKPNT | | | 8 | | | |
| \$SS | | 67 | | | | |
| GP3 | 12 | | 3 | | | 01 |
| SAVE | 12 | | 3 | | | 01 |
| PARAM | 12 | | 3 5 | | | 01 |
| CHKPNT | 12 | | 3 | | | 01 |
| \$SS | | 6 | | | | |
| TAIL | 1234567 | | 3 | | | |
| SAVE | 1234567 | | 3 | | | |
| COND | 12345678 | | 3 | | | |
| PURGE | 1234567 | | 3 | | | |
| CHKPNT | 1234567 | | 3 | | | |
| \$SS | | 6 | | | | |
| PARAM | 1234 6 | | | | | |
| EMG | 12345678 | | | | | |

STATIC AEROELASTIC ANALYSIS

| DMP Inst. | 1 | 10 | 20 | 30 | 40 | 50 | 60 |
|--------------|-------------|-----|----|----|----|----|----|
| SAVE | 12345678 | | | | | | |
| CHKPNT | 12345678 | | | | | | |
| \$\$\$ | 6 | | | | | | |
| COND | 1234 6 8 | | | | | | |
| EMA | 1234 6 8 | | | | | | |
| CHKPNT | 1234 6 8 | | | | | | |
| \$\$\$ | 6 | | | | | | |
| LABEL | 12345 78 | 4 | 4 | | | | |
| COND | 12345 78 | 4 | 4 | | | | |
| EMA | 12345 78 | 4 | 4 | | | | |
| CHKPNT | 12345 78 | 4 | 4 | | | | |
| \$\$\$ | 6 | | | | | | |
| LABEL | 12345 78 | 4 | 4 | | | | |
| COND | 123 5 78 | 45 | 4 | | | | |
| \$\$\$ | 1/2 | | | | | | |
| COND | 123 5 78 | 45 | 4 | | | | |
| \$\$\$ | 8 | | | | | | |
| GPWG | 123 5 78 | 45 | 4 | | | | |
| \$\$\$ | 8 | | | | | | |
| DFP | 123 5 78 | 45 | 4 | | | | |
| \$\$\$ | 8 | | | | | | |
| LABEL | 123 5 78 | 45 | 4 | | | | |
| \$\$\$ | 8 | | | | | | |
| EQUIV | 1234 6 8 | | | | | | |
| CHKPNT | 1234 6 8 | | | | | | |
| \$\$\$ | 6 | | | | | | |
| COND | 1234 6 8 | | | | | | |
| SMA3 | 1234 6 8 | | | | | | |
| CHKPNT | 1234 6 8 | | | | | | |
| \$\$\$ | 6 | | | | | | |
| LABEL | 1234 6 8 | | | | | | |
| PARAM | 1 | 901 | | | | | |
| GP4 | 1 | 901 | | | | | |
| SAVE | 1 | 901 | | | | | |
| COND | 1 | 901 | | | | | |
| PURGE | 1 | 901 | | | | | |
| CHKPNT | 1234 6 8901 | | | | | | |
| \$\$\$ | 6 | | | | | | |
| COND | 1 | 2 | | | | | |
| JUMP | 1 | 2 | | | | | |
| LABEL | 1 | 2 | | | | | |
| COND | 123 6 890 | | | | | | |
| GPSP | 123 6 890 | | | | | | |
| SAVE | 123 6 890 | | | | | | |
| COND | 123 6 890 | | | | | | |
| DFP | 123 6 890 | | | | | | |
| LABEL | 123 6 890 | | | | | | |
| EQUIV | 1234 6 89 | | | | | | |
| CHKPNT | 1234 6 89 | | | | | | |
| \$\$\$ | 6 | | | | | | |
| COND | 1234 6 89 | | | | | | |

RIGID FORMAT RESTART TABLES

| DMP Inst. | | | Bit Position | | | | | |
|--------------|------|---------|--------------|----|----|----|------|--|
| | 1 | 10 | 20 | 30 | 40 | 50 | 60 | |
| MCE1 | 1 | 9 | | | | | | |
| CHKPNT | 1 | 9 | | | | | | |
| \$\$\$ | | 6 | | | | | | |
| MCE2 | 1234 | 6 89 | | | | | | |
| CHKPNT | 1234 | 6 89 | | | | | | |
| \$\$\$ | | 6 | | | | | | |
| LABEL | 1234 | 6 89 | | | | | | |
| EQUIV | 1234 | 6 890 | | | | | | |
| CHKPNT | 1234 | 6 890 | | | | | | |
| \$\$\$ | | 6 | | | | | | |
| COND | 1234 | 6 890 | | | | | | |
| SCE1 | 1234 | 6 890 | | | | | | |
| CHKPNT | 1234 | 6 890 | | | | | | |
| \$\$\$ | | 6 | | | | | | |
| LABEL | 1234 | 6 890 | | | | | | |
| EQUIV | 1234 | 6 8901 | | | | | | |
| CHKPNT | 1234 | 6 8901 | | | | | | |
| \$\$\$ | | 6 | | | | | | |
| COND | 1234 | 6 8901 | | | | | | |
| SMP1 | 1234 | 6 8901 | | | | | | |
| CHKPNT | 1234 | 6 8901 | | | | | | |
| \$\$\$ | | 6 | | | | | | |
| LABEL | 1234 | 6 8901 | | | | | | |
| RBMG2 | 1234 | 6 8901 | | | | | | |
| CHKPNT | 1234 | 6 8901 | | | | | | |
| \$\$\$ | | 6 | | | | | | |
| SSG1 | 123 | 5678 | 3 | | | | 9012 | |
| CHKPNT | 123 | 5678 | 3 | | | | 9012 | |
| \$\$\$ | | 6 | | | | | | |
| PARAM | 123 | 5678 | 3 | 6 | | | 9012 | |
| COND | 123 | 5678 | 3 | 6 | | | 9012 | |
| ALG | 123 | 5678 | 3 | 67 | | | 9012 | |
| COND | 123 | 5678 | 3 | 6 | | | 9012 | |
| PARAM | 123 | 5678 | 3 | 6 | | | 9012 | |
| COND | 123 | 5678 | 3 | 6 | | | 9012 | |
| GP3 | 123 | 5678 | 3 | 6 | | | 9012 | |
| CHKPNT | 123 | 5678 | 3 | 6 | | | 9012 | |
| \$\$\$ | | 6 | | | | | | |
| SSG1 | 123 | 5678 | 3 | 6 | | | 9012 | |
| CHKPNT | 123 | 5678 | 3 | 6 | | | 9012 | |
| \$\$\$ | | 6 | | | | | | |
| ADD | 123 | 5678 | 3 | 6 | | | 9012 | |
| LABEL | 123 | 5678 | 3 | 6 | | | 9012 | |
| EQUIV | 123 | 5678 | 3 | 6 | | | 9012 | |
| CHKPNT | 123 | 5678 | 3 | 6 | | | 9012 | |
| \$\$\$ | | 6 | | | | | | |
| EQUIV | 123 | 5678901 | 3 | 6 | | | 9012 | |
| CHKPNT | 123 | 5678901 | 3 | 6 | | | 9012 | |
| \$\$\$ | | 6 | | | | | | |
| COND | 123 | 5678901 | 3 | 6 | | | 9012 | |
| SSG2 | 123 | 5678901 | 3 | 6 | | | 9012 | |

STATIC AEROELASTIC ANALYSIS

| DMAP Inst. | 1 | 10 | 20 | Bit Position | | 40 | 50 | 60 |
|---------------|---------------|----|----|--------------|--|----|----|------|
| | | | | 30 | | | | |
| CHKPNT | 123 5678901 3 | | | 6 | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| LABEL | 123 5678901 3 | | | 6 | | | | 9012 |
| SSG3 | 12345678901 3 | | | 6 | | | | 9012 |
| SAVE | 12345678901 3 | | | 6 | | | | 9012 |
| CHKPNT | 12345678901 3 | | | 6 | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| COND | 12345678901 3 | 7 | | 6 | | | | 9012 |
| MATGPR | 12345678901 3 | 7 | | 6 | | | | 9012 |
| MATGPR | 12345678901 3 | 7 | | 6 | | | | 9012 |
| LABFL | 12345678901 3 | 7 | | 6 | | | | 9012 |
| SDR 1 | 12345678901 3 | | | 6 | | | | 9012 |
| CHKPNT | 12345678901 3 | | | 6 | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| SDR 2 | | | 9 | | | | | |
| PARAM | | | 9 | | | | | |
| DEF | | | 9 | | | | | |
| SAVE | | | 9 | | | | | |
| COND | | | 8 | | | | | |
| \$\$\$ | 7 | | | | | | | |
| PLOT | | | 8 | | | | | |
| \$\$\$ | 7 | | | | | | | |
| SAVE | | | 8 | | | | | |
| \$\$\$ | 7 | | | | | | | |
| PRTMSG | | | 8 | | | | | |
| \$\$\$ | 7 | | | | | | | |
| LABEL | | | 8 | | | | | |
| \$\$\$ | 7 | | | | | | | |
| TA1 | 12345678901 | | | 6 | | | | 9012 |
| DSMG1 | 12345678901 | | | 6 | | | | 9012 |
| CHKPNT | 12345678901 | | | 6 | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| COND | 123 5678 | 3 | | 6 | | | | 9012 |
| EQUIV | 123 5678 | 3 | | 6 | | | | 9012 |
| LABEL | 123 5678 | 3 | | 6 | | | | 9012 |
| PARAM | 12345678901 | | | 6 | | | | 9012 |
| PARAM | 12345678901 | | | 6 | | | | 9012 |
| PARAMR | 12345678901 | | | 6 | | | | 9012 |
| PARAML | 12345678901 | | | 6 | | | | 9012 |
| JUMP | 12345678901 | | | 6 | | | | 9012 |
| LABEL | 12345678901 | | | 6 | | | | 9012 |
| EQUIV | 12345678901 | | | 6 | | | | 9012 |
| CHKPNT | 12345678901 | | | 6 | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| PARAM | 12345678901 | | | 6 | | | | 9012 |
| EQUIV | 12345678901 | | | 6 | | | | 9012 |
| CHKPNT | 12345678901 | | | 6 | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| COND | 12345678901 | | | 6 | | | | 9012 |
| MCF2 | 12345678901 | | | 6 | | | | 9012 |
| CHKPNT | 12345678901 | | | 6 | | | | 9012 |

RIGID FORMAT RESTART TABLES

| DMAP Inst. | 1 | 10 | 20 | <u>Bit Position</u> | | 40 | 50 | 60 |
|---------------|-------------|----|-------|---------------------|--|----|----|------|
| | | | | 30 | | | | |
| \$\$\$ | 6 | | | | | | | |
| LABEL | 12345678901 | | 6 | | | | | 9012 |
| EQUIV | 12345678901 | | 6 | | | | | 9012 |
| CHKPNT | 12345678901 | | 6 | | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| COND | 12345678901 | | 6 | | | | | 9012 |
| SCF1 | 12345678901 | | 6 | | | | | 9012 |
| CHKPNT | 12345678901 | | 6 | | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| LABEL | 12345678901 | | 6 | | | | | 9012 |
| EQUIV | 12345678901 | | 6 | | | | | 9012 |
| CHKPNT | 12345678901 | | 6 | | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| COND | 12345678901 | | 6 | | | | | 9012 |
| SMP2 | 12345678901 | | 6 | | | | | 9012 |
| CHKPNT | 12345678901 | | 6 | | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| LABEL | 12345678901 | | 6 | | | | | 9012 |
| ADD | 12345678901 | | 6 | | | | | 9012 |
| ADD | 12345678901 | | 6 | | | | | 9012 |
| ADD | 12345678901 | | 6 | | | | | 9012 |
| COND | 12345678901 | | 6 | | | | | 9012 |
| MPYAD | 12345678901 | | 6 | | | | | 9012 |
| MPYAD | 12345678901 | | 6 | | | | | 9012 |
| UMERGE | 12345678901 | | 6 | | | | | 9012 |
| EQUIV | 12345678901 | | 6 | | | | | 9012 |
| COND | 12345678901 | | 6 | | | | | 9012 |
| UMERGE | 12345678901 | | 6 | | | | | 9012 |
| LABEL | 12345678901 | | 6 | | | | | 9012 |
| ADD | 12345678901 | | 6 | | | | | 9012 |
| EQUIV | 12345678901 | | 6 | | | | | 9012 |
| LABEL | 12345678901 | | 6 | | | | | 9012 |
| ADD | 12345678901 | | 6 | | | | | 9012 |
| COPY | 12345678901 | | 6 | | | | | 9012 |
| RBMG2 | 12345678901 | | 23 6 | | | | | 9012 |
| SAVF | 12345678901 | | 23 6 | | | | | 9012 |
| CHKPNT | 12345678901 | | 23 6 | | | | | 9012 |
| \$\$\$ | 6 | | | | | | | |
| PRTPARM | 12345678901 | | 23 6 | | | | | 9012 |
| PRTPARM | 12345678901 | | 23 6 | | | | | 9012 |
| JUMP | 12345678901 | | 23 6 | | | | | 9012 |
| LABEL | 12345678901 | | 23 6 | | | | | 9012 |
| PARAM | 12345678901 | | 23 6 | | | | | 9012 |
| COND | 12345678901 | | 23 6 | | | | | 9012 |
| ALG | 12345678901 | | 23 67 | | | | | 9012 |
| COND | 12345678901 | | 23 6 | | | | | 9012 |
| PARAM | 12345678901 | | 23 6 | | | | | 9012 |
| PARAM | 12345678901 | | 23 6 | | | | | 9012 |
| COND | 12345678901 | | 23 6 | | | | | 9012 |
| GP3 | 12345678901 | | 23 6 | | | | | 9012 |
| SSG1 | 12345678901 | | 23 6 | | | | | 9012 |

STATIC AEROELASTIC ANALYSIS

| DMAP Inst. | 1 | 10 | Bit Position | | 40 | 50 | 60 |
|---------------|-------------|----|--------------|-----|----|----|------|
| | | | 20 | 30 | | | |
| ADD | 12345678901 | | 23 | 6 | | | 9012 |
| LABEL | 12345678901 | | 23 | 6 | | | 9012 |
| EQUIV | 12345678901 | | 23 | 6 | | | 9012 |
| CHKPNT | 12345678901 | | 23 | 6 | | | 9012 |
| \$\$\$ | 6 | | | | | | |
| SSG2 | 12345678901 | | 23 | 6 | | | 9012 |
| SSG3 | 12345678901 | | 23 | 6 | | | 9012 |
| SAVF | 12345678901 | | 23 | 6 | | | 9012 |
| CHKPNT | 12345678901 | | 23 | 6 | | | 9012 |
| \$\$\$ | 6 | | | | | | |
| COND | 12345678901 | 7 | 23 | 6 | | | 9012 |
| MATGPR | 12345678901 | 7 | 23 | 6 | | | 9012 |
| LABEL | 12345678901 | 7 | 23 | 6 | | | 9012 |
| SDR1 | 12345678901 | | 23 | 6 | | | 9012 |
| CHKPNT | 12345678901 | | 23 | 6 | | | 9012 |
| \$\$\$ | 6 | | | | | | |
| COND | 12345678901 | | 23 | 6 | | | 9012 |
| EQUIV | 12345678901 | | 23 | 6 | | | 9012 |
| LABEL | 12345678901 | | 23 | 6 | | | 9012 |
| ADD | 12345678901 | | 23 | 6 | | | 9012 |
| DSMG1 | 12345678901 | | 23 | 6 | | | 9012 |
| CHKPNT | 12345678901 | | 23 | 6 | | | 9012 |
| \$\$\$ | 6 | | | | | | |
| MPYAD | 12345678901 | | 23 | 6 | | | 9012 |
| ADD | 12345678901 | | 23 | 6 | | | 9012 |
| DSCHK | 12345678901 | | 23 | 6 | | | 9012 |
| SAVE | 12345678901 | | 23 | 6 | | | 9012 |
| COND | 12345678901 | | 23 | 6 | | | 9012 |
| COND | 12345678901 | | 23 | 6 | | | 9012 |
| EQUIV | 12345678901 | | 23 | 6 | | | 9012 |
| EQUIV | 12345678901 | | 23 | 6 | | | 9012 |
| EQUIV | 12345678901 | | 23 | 6 | | | 9012 |
| REPT | 12345678901 | | 23 | 6 | | | 9012 |
| TABPT | 12345678901 | | 23 | 6 | | | 9012 |
| LABEL | 12345678901 | | 23 | 6 | | | 9012 |
| ADD | 12345678901 | | 23 | 6 | | | 9012 |
| CHKPNT | 12345678901 | | 23 | 6 | | | 9012 |
| \$\$\$ | 6 | | | | | | |
| EQUIV | 12345678901 | | 23 | 6 | | | 9012 |
| CHKPNT | 12345678901 | | 23 | 6 | | | 9012 |
| \$\$\$ | 6 | | | | | | |
| EQUIV | 12345678901 | | 23 | 6 | | | 9012 |
| REPT | 12345678901 | | 23 | 6 | | | 9012 |
| TABPT | 12345678901 | | 23 | 6 | | | 9012 |
| LABEL | 12345678901 | | 23 | 6 | | | 9012 |
| PARAM | 12345678901 | | 23 | 6 8 | | | 9012 |
| COND | 12345678901 | | 23 | 6 8 | | | 9012 |
| ADD | 12345678901 | | 23 | 6 8 | | | 9012 |
| OUTPUT1 | 12345678901 | | 23 | 6 8 | | | 9012 |
| OUTPUT1 | 12345678901 | | 23 | 6 8 | | | 9012 |
| LABEL | 12345678901 | | 23 | 6 8 | | | 9012 |

RIGID FORMAT RESTART TABLES

| DMAP Inst. | 1 | 10 | 20 | <u>Bit Position</u> | | 30 | 40 | 50 | 60 |
|---------------|---------------------|-----|----|---------------------|--|----|----|----|------|
| CHKPNT | | | 9 | | | | | | |
| \$\$\$ | 6 | | | | | | | | |
| ALG | 12345678901 | | 23 | 67 | | | | | 9012 |
| SOR 2 | | | 89 | | | | | | |
| OFF | | | 9 | | | | | | |
| SAVE | | | 9 | | | | | | |
| SOR 1 | 12345678901 | | 23 | 6 | | | | | 9012 |
| GP FOR | 12345678901 | | 23 | 6 | | | | | 9012 |
| OFF | 12345678901 | | 23 | 6 | | | | | 9012 |
| COND | | | 8 | | | | | | |
| \$\$\$ | 7 | | | | | | | | |
| PLUT | | | 8 | | | | | | |
| \$\$\$ | 7 | | | | | | | | |
| SAVE | | | 8 | | | | | | |
| \$\$\$ | 7 | | | | | | | | |
| PRTMSG | | | 8 | | | | | | |
| \$\$\$ | 7 | | | | | | | | |
| LABEL | | | 8 | | | | | | |
| \$\$\$ | 7 | | | | | | | | |
| JUMP | 1234567890123456789 | 234 | | | | | | | 9012 |
| LABEL | 1234567890123456789 | 234 | | | | | | | 9012 |
| PRTPARM | 1234567890123456789 | 234 | | | | | | | 9012 |
| LABEL | 1234567890123456789 | 234 | | | | | | | 9012 |
| PRTPARM | 1234567890123456789 | 234 | | | | | | | 9012 |
| LABEL | 1234567890123456789 | 234 | | | | | | | 9012 |
| PRTPARM | 1234567890123456789 | 234 | | | | | | | 9012 |
| \$\$\$ | 8 | | | | | | | | |
| LABEL | 1234567890123456789 | 234 | | | | | | | 9012 |
| \$\$\$ | 8 | | | | | | | | |
| PRTPARM | 1234567890123456789 | 234 | | | | | | | 9012 |
| LABEL | 1234567890123456789 | 234 | | | | | | | 9012 |
| END | 1234567890123456789 | 234 | | | | | | | 9012 |

STATIC AEROELASTIC ANALYSIS

10.21.4 Rigid Format Change Restart Table

| DMAP Inst. | 63 | <u>Bit Position</u> 70 | 80 |
|---------------|-----|---------------------------|-----|
| BEGIN | 345 | 78901234567 | 345 |
| GP1 | | | |
| SAVE | | | |
| COND | | | |
| CHKPNT | | | |
| GP2 | | | |
| CHKPNT | | | |
| PARAML | | | |
| PARAMR | | | |
| PURGE | | | |
| COND | | | |
| PLTSET | | | |
| SAVE | | | |
| PRTHSG | | | |
| PARAM | | | |
| PARAM | | | |
| COND | | | |
| PLOT | | | |
| SAVE | | | |
| PRTHSG | | | |
| LABEL | | | |
| CHKPNT | | | |
| GP3 | | | |
| SAVE | | | |
| PARAM | 345 | 78901234567 | 345 |
| CHKPNT | | | |
| TA1 | | | |
| SAVE | | | |
| COND | 345 | 78901234567 | 345 |
| PURGE | | | |
| CHKPNT | | | |
| PARAM | | | |
| EMG | | | |
| SAVE | | | |
| CHKPNT | | | |
| COND | | | |
| EMA | | | |
| CHKPNT | | | |
| LABEL | | | |
| COND | | | |
| EMA | | | |
| CHKPNT | | | |
| LABEL | | | |
| COND | | | |
| COND | | | |
| PWG | | | |
| QFP | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |

RIGID FORMAT RESTART TABLES

| DMAP Inst. | 63 | <u>Bit Position</u> 70 | 80 |
|---------------|-----|---------------------------|-----|
| SMA3 | | | |
| CHKPNT | | | |
| LABEL | | | |
| PARAM | | | |
| GP4 | | | |
| SAVE | | | |
| COND | 345 | 901234567 | 345 |
| PURGE | | | |
| CHKPNT | | | |
| COND | 345 | 901234567 | 345 |
| JUMP | 345 | 901234567 | 345 |
| LABEL | 345 | 901234567 | 345 |
| COND | | | |
| GPSP | | | |
| SAVE | | | |
| COND | | | |
| QFP | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| MCE1 | | | |
| CHKPNT | | | |
| MCE2 | | | |
| CHKPNT | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| SCE1 | | | |
| CHKPNT | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| SMP1 | | | |
| CHKPNT | | | |
| LABEL | | | |
| RMG2 | | | |
| CHKPNT | | | |
| SSG1 | | | |
| CHKPNT | | | |
| PARAM | | | |
| COND | | | |
| ALG | | | |
| COND | | | |
| PARAM | | | |
| COND | | | |
| GP3 | | | |
| CHKPNT | | | |
| SSG1 | | | |

STATIC AEROELASTIC ANALYSIS

| DMAP | Bit Position | | |
|--------|--------------|------------|-----|
| Inst. | 63 | 70 | 80 |
| CHKPNT | | | |
| ADD | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| SSG2 | | | |
| CHKPNT | | | |
| LABEL | | | |
| SSG3 | 4 | | |
| SAVE | 4 | | |
| CHKPNT | 4 | | |
| COND | 45 | 8901234567 | 345 |
| MATGPR | 45 | 8901234567 | 345 |
| MATGPR | 45 | 8901234567 | 345 |
| LABEL | 45 | 8901234567 | 345 |
| SDR 1 | | | |
| CHKPNT | | | |
| SDR 2 | | | |
| PARAM | | | |
| OFF | | | |
| SAVE | | | |
| COND | | | |
| PLOT | | | |
| SAVE | | | |
| PRTMSG | | | |
| LABEL | | | |
| TA1 | | | |
| DSMG1 | | | |
| CHKPNT | | | |
| COND | | | |
| EQUIV | | | |
| LABEL | | | |
| PARAM | | | |
| PARAM | | | |
| PARAMR | | | |
| PARAML | | | |
| JUMP | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| PARAM | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| MCE2 | | | |
| CHKPNT | | | |
| LABEL | | | |
| EQUIV | | | |

RIGID FORMAT RESTART TABLES

| DMAP Inst. | 63 | Bit Position 70 | 80 |
|---------------|----|--------------------|----|
| CHKPNT | | | |
| COND | | | |
| SCE1 | | | |
| CHKPNT | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| SMP2 | | | |
| CHKPNT | | | |
| LABEL | | | |
| ADD | | | |
| ADD | | | |
| ADD | | | |
| COND | | | |
| MPYAD | | | |
| MPYAD | | | |
| UMERGE | | | |
| FQUIV | | | |
| COND | | | |
| UMERGE | | | |
| LABEL | | | |
| ADD | | | |
| EQUIV | | | |
| LABEL | | | |
| ADD | | | |
| COPY | | | |
| RMG2 | | | |
| SAVE | | | |
| CHKPNT | | | |
| PRTPARM | | | |
| PRTPARM | | | |
| JUMP | | | |
| LABEL | | | |
| PARAM | | | |
| COND | | | |
| ALG | | | |
| COND | | | |
| PARAM | | | |
| PARAM | | | |
| COND | | | |
| GP3 | | | |
| SSG1 | | | |
| ADD | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| SSG2 | | | |
| SSG3 | | | |
| SAVE | | | |
| CHKPNT | | | |

STATIC AEROELASTIC ANALYSIS

| DMAP | <u>Bit Position</u> | | |
|---------|---------------------|-------------|-----|
| Inst. | 63 | 70 | 80 |
| COND | | | |
| MATGPR | | | |
| LABEL | | | |
| SDR 1 | 345 | 78901234567 | 345 |
| CHKPNT | 345 | 78901234567 | 345 |
| COND | | | |
| EQUIV | | | |
| LABEL | | | |
| ADD | | | |
| DSMGI | | | |
| CHKPNT | | | |
| MPYAD | | | |
| ADD | | | |
| DSCHK | | | |
| SAVE | | | |
| COND | | | |
| COND | | | |
| EQUIV | | | |
| EQUIV | | | |
| EQUIV | | | |
| REPT | | | |
| TABPT | | | |
| LABEL | | | |
| ADD | | | |
| CHKPNT | | | |
| EQUIV | | | |
| CHKPNT | | | |
| EQUIV | | | |
| REPT | | | |
| TABPT | | | |
| LABEL | | | |
| PARAM | | | |
| COND | | | |
| ADD | | | |
| OUTPUT1 | | | |
| OUTPUT1 | | | |
| LABEL | | | |
| CHKPNT | | | |
| ALG | | | |
| SDR 2 | | | |
| OFF | | | |
| SAVE | | | |
| SDR 1 | | | |
| GPFOR | | | |
| OFF | | | |
| COND | | | |
| PLOT | | | |
| SAVE | | | |
| PRMSG | | | |
| LABEL | | | |
| JUMP | 345 | 78901234567 | 345 |

RIGID FORMAT RESTART TABLES

| DMAP Int. | 63 | <u>Bit Position</u> 70 | 80 |
|--------------|-----|---------------------------|-----|
| LABEL | 345 | 78901234567 | 345 |
| PRTPARM | 345 | 78901234567 | 345 |
| LABEL | 345 | 78901234567 | 345 |
| PRTPARM | 345 | 78901234567 | 345 |
| LABEL | 345 | 78901234567 | 345 |
| PRTPARM | 345 | 78901234567 | 345 |
| LABEL | 345 | 78901234567 | 345 |
| PRTPARM | 345 | 78901234567 | 345 |
| LABEL | 345 | 78901234567 | 345 |
| END | 345 | 78901234567 | 345 |

STATIC AEROELASTIC ANALYSIS

10.21.5 File Name Restart Table

| DMAP Inst. | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|---------------|----|-----|--------------|-----|-----|-----|-----|
| | | | 110 | 120 | | | |
| BEGIN | | | | | | | |
| GP1 | 4 | | | | | | |
| SAVE | 4 | | | | | | |
| COND | 4 | | | | | | |
| CHKPNT | 4 | | | | | | |
| GP2 | 5 | | | | | | |
| CHKPNT | 5 | | | | | | |
| PARAML | | | | 2 | | | |
| PARAMR | | | 7 | | | | |
| PURGE | | | | 2 | | | |
| COND | | | | 2 | | | |
| PLTSET | | | | 2 | | | |
| SAVE | | | | 2 | | | |
| PRTMSG | | | | 2 | | | |
| PARAM | | | | 2 | | | |
| PARAM | | | | 2 | | | |
| COND | | | | 2 | | | |
| PLOT | | | | | | | |
| SAVE | | | | | | | |
| PRTMSG | | | | | | | |
| LABEL | | | | | | | |
| CHKPNT | | | | 2 | | | |
| GP3 | 6 | | | | | | |
| SAVE | 6 | | | | | | |
| PARAM | 6 | 9 | | | | | |
| CHKPNT | 6 | | | | | | |
| TAL | 7 | | | | | | |
| SAVE | 7 | | | | | | |
| COND | 7 | 9 | | | | | |
| PURGE | 7 | 2 | | | | | |
| CHKPNT | 7 | | | | | | |
| PARAM | 8 | | | | | | |
| EMG | | | | 3 | | | |
| SAVE | | | | 3 | | | |
| CHKPNT | | | | 3 | | | |
| COND | 8 | | | | | | |
| EMA | 8 | | | | | | |
| CHKPNT | 8 | | | | | | |
| LABEL | 8 | | | | | | |
| COND | 9 | | | | | | |
| EMA | 9 | | | | | | |
| CHKPNT | 9 | | | | | | |
| LABEL | 9 | | | | | | |
| COND | | | | | | | |
| COND | | | | | | | |
| GPWG | | | | | | | |
| DFF | | | | | | | |
| LABEL | 7 | 9 | | | | | |
| EQUIV | | 0 | | | | | |
| CHKPNT | | 0 | | | | | |
| COND | | 0 | | | | | |

RIGID FORMAT RESTART TABLES

| DMAP | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|--------|----|--------|--------------|-----|-----|-----|-----|
| Inst. | | | 110 | 120 | | | |
| SMA3 | | 0 | | | | | |
| CHKPNT | | 0 | | | | | |
| LABEL | | 0 | | | | | |
| PARAM | | 1 | | | | | |
| GP4 | | 1 | | | | | |
| SAVE | | 1 | | | | | |
| COND | | 1 | | | | | |
| PURGE | | 1 3 56 | 901 | 5 7 | | | |
| CHKPNT | | 1 3 56 | 901 | 5 7 | | | |
| COND | | | | | | | |
| JUMP | | | | | | | |
| LABEL | | | | | | | |
| COND | | 2 | | | | | |
| GPSP | | 2 | | | | | |
| SAVE | | 2 | | | | | |
| COND | | 2 | | | | | |
| OFF | | 2 | | | | | |
| LABEL | | 2 | | | | | |
| EQUIV | | 4 | | | | | |
| CHKPNT | | 4 | | | | | |
| COND | | 34 | | | | | |
| MCE1 | | 3 | | | | | |
| CHKPNT | | 3 | | | | | |
| MCF2 | | 4 | | | | | |
| CHKPNT | | 4 | | | | | |
| LABEL | | 34 | | | | | |
| EQUIV | | 5 | | | | | |
| CHKPNT | | 5 | | | | | |
| COND | | 5 | | | | | |
| SCE1 | | 5 | | | | | |
| CHKPNT | | 5 | | | | | |
| LABEL | | 5 | | | | | |
| EQUIV | | 6 | | | | | |
| CHKPNT | | 6 | | | | | |
| COND | | 6 | | | | | |
| SMP1 | | 6 | | | | | |
| CHKPNT | | 6 | | | | | |
| LABEL | | 6 | | | | | |
| PRMG2 | | 7 | | | | | |
| CHKPNT | | 7 | | | | | |
| SSG1 | | | | | 2 | | |
| CHKPNT | | | | | 2 | | |
| PARAM | | | | 4 | | | |
| COND | | | | 4 | | | |
| ALG | | | | 4 | | | |
| COND | | | | | | | |
| PARAM | | | | 5 | | | |
| COND | | | | 5 | | | |
| GP3 | | | | 5 | | | |
| CHKPNT | | | | 5 | | | |
| SSG1 | | | | 6 | | | |

STATIC AEROELASTIC ANALYSIS

| DMAP Inst. | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|---------------|----|-----|--------------|-----|-----|-----|-----|
| | | | 110 | 120 | | | |
| CHKPNT | | | | | 6 | | |
| ADD | | | 8 | | | | |
| LABEL | | | 8 | | | | |
| EQUIV | | | 8 | | | | |
| CHKPNT | | | 8 | | | | |
| EQUIV | | | 9 | | | | |
| CHKPNT | | | 9 | | | | |
| COND | | | 9 | | | | |
| SSG2 | | | 9 | | | | |
| CHKPNT | | | 9 | | | | |
| LABEL | | | 9 | | | | |
| SSG3 | | | 0 | | | | |
| SAVE | | | 0 | | | | |
| CHKPNT | | | 0 | | | | |
| COND | | | | | | | |
| MATGPR | | | | | | | |
| MATGPR | | | | | | | |
| LABEL | | | | | | | |
| SDR1 | | | 1 | | | | |
| CHKPNT | | | 1 | | | | |
| SDR2 | | | 2 | | | | |
| PARAM | | | | | | | |
| DFP | | | | | | | |
| SAVE | | | | | | | |
| COND | | | | | | | |
| PLDT | | | | | | | |
| SAVE | | | | | | | |
| PRTMSG | | | | | | | |
| LABEL | | | | | | | |
| TA1 | | | 3 | | | | |
| DSNG1 | | | 3 | | | | |
| CHKPNT | | | 3 | | | | |
| COND | | | | | | | |
| EQUIV | | | | | | | |
| LABEL | | | | | | | |
| PARAM | | | | | | | |
| PARAM | | | | | | | |
| PARAMR | | | | | | | |
| PARAML | | | | | | | |
| JUMP | | | | | | | |
| LABEL | | | | | | | |
| EQUIV | | | 4 | | | | |
| CHKPNT | | | 4 | | | | |
| PARAM | | | 4 | | | | |
| EQUIV | | | 4 | | | | |
| CHKPNT | | | 4 | | | | |
| COND | | | 4 | | | | |
| MCF2 | | | 4 | | | | |
| CHKPNT | | | 4 | | | | |
| LABEL | | | 4 | | | | |
| EQUIV | | | 5 | | | | |

RIGID FORMAT RESTART TABLES

| DMAP | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|---------|----|-----|--------------|-----|-----|-----|-----|
| Inst. | | | 110 | 120 | | | |
| CHKPNT | | | 5 | | | | |
| COND | | | 5 | | | | |
| SCE1 | | | 5 | | | | |
| CHKPNT | | | 5 | | | | |
| LABEL | | | 5 | | | | |
| EQUIV | | | 6 | | | | |
| CHKPNT | | | 6 | | | | |
| COND | | | 6 | | | | |
| SMP2 | | | 6 | | | | |
| CHKPNT | | | 6 | | | | |
| LABEL | | | 6 | | | | |
| ADD | | | 7 | | | | |
| ADD | | | 7 | | | | |
| ADD | | | 7 | | | | |
| COND | | | | | | | |
| MPYAD | | | | | | | |
| MPYAD | | | | | | | |
| UMERGE | | | | | | | |
| EQUIV | | | | | | | |
| COND | | | | | | | |
| UMERGE | | | | | | | |
| LABEL | | | | | | | |
| ADD | | | | | | | |
| EQUIV | | | | | | | |
| LABEL | | | | | | | |
| ADD | | | | | | | |
| COPY | | | | | 3 | | |
| RB4G2 | | | 8 | | | | |
| SAVE | | | 8 | | | | |
| CHKPNT | | | 8 | | | | |
| PRTPARM | | | 8 | | | | |
| PRTPARM | | | 8 | | | | |
| JUMP | | | | | | | |
| LABEL | | | | | | | |
| PARAM | | | | | | | |
| COND | | | | | 7 | | |
| ALG | | | | | 7 | | |
| COND | | | | | | | |
| PARAM | | | | | | | |
| PARAM | | | | | | | |
| COND | | | | | 890 | | |
| GP3 | | | | | 8 | | |
| SSG1 | | | | | 9 | | |
| ADD | | | | | 0 | | |
| LABEL | | | | | | | |
| EQUIV | | | | | | | |
| CHKPNT | | | | | 0 | | |
| SSG2 | | | | | | | |
| SSG3 | | | 9 | | | | |
| SAVE | | | | | | | |
| CHKPNT | | | | | | | |

STATIC AEROELASTIC ANALYSIS

| DMAP | Inst. | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|---------|-------|----|-----|--------------|-----|-----|-----|-----|
| | | | | 110 | 120 | | | |
| COND | | | | | | | | |
| MATGPR | | | | | | | | |
| LABEL | | | | | | 0 | | |
| SDR 1 | | | | | | 0 | | |
| CHKPNT | | | | | | | | |
| COND | | | | | | | | |
| EQUIV | | | | | | | | |
| LABEL | | | | | | | | |
| ADD | | | | | | | | |
| DSMGL | | | | | | | | |
| CHKPNT | | | | | | | | |
| MPYAD | | | | | | | | |
| ADD | | | | | | | | |
| DSCCHK | | | | | | | | |
| SAVE | | | | | | | | |
| COND | | | | | | | | |
| COND | | | | | | | | |
| EQUIV | | | | | | | | |
| EQUIV | | | | | | | | |
| EQUIV | | | | | | | | |
| REPT | | | | | | | | |
| TABPT | | | | | | | | |
| LABEL | | | | | | | | |
| ADD | | | | | | | | |
| CHKPNT | | | | | | | | |
| EQUIV | | | | | | | | |
| CHKPNT | | | | | | | | |
| EQUIV | | | | | | | | |
| REPT | | | | | | | | |
| TABPT | | | | | | | | |
| LABEL | | | | | | | | |
| PARAM | | | | | | | | |
| COND | | | | | | | | |
| ADD | | | | | | | | |
| OUTPUT1 | | | | | | | | |
| OUTPUT1 | | | | | | | | |
| LABEL | | | | | | | | |
| CHKPNT | | | | | | | | |
| ALG | | | | | | 1 | | |
| SDR 2 | | | | | 1 | | | |
| QFP | | | | | | | | |
| SAVE | | | | | | | | |
| SDR 1 | | | | | | | | |
| QPFOR | | | | | | | | |
| QFP | | | | | | | | |
| COND | | | | | | | | |
| PLOT | | | | | | | | |
| SAVE | | | | | | | | |
| PRTMSG | | | | | | | | |
| LABEL | | | | | | | | |
| JUMP | | | | | | | | |

| DMAP Inst. | 94 | 100 | Bit Position | | | | |
|---------------|----|-----|--------------|-----|-----|-----|-----|
| | | | 110 | 120 | 130 | 140 | 150 |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |
| LABEL | | | | | | | |
| END | | | | | | | |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

10.22 RESTART TABLES FOR COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

10.22.1 Bit Positions for Card Name Restart Table

| <u>Card Name</u> | <u>Bit Pos.</u> | <u>Card Name</u> | <u>Bit Pos.</u> | <u>Card Name</u> | <u>Bit Pos.</u> |
|------------------|-----------------|------------------|-----------------|------------------|-----------------|
| ADUM1 | 1 | CQDPLT | 2 | MAT2 | 8 |
| ADUM2 | 1 | CQUAD1 | 2 | MAT3 | 8 |
| ADUM3 | 2 | CQUAD2 | 2 | MATT1 | 8 |
| ADUM4 | 5 | CQUADTS | 2 | MATT2 | 8 |
| ADUM5 | 7 | CKOD | 2 | MATT3 | 8 |
| ADUM6 | 1 | CSHEAR | 2 | TABLEM1 | 8 |
| ADUM7 | 1 | CTEIRA | 2 | TABLEM2 | 9 |
| ADUM8 | 1 | CTORDRG | 2 | TABLEM3 | 8 |
| ADUM9 | 1 | CTRAPAX | 2 | TABLEM4 | 8 |
| AXIC | 1 | CTRAPRG | 2 | TEMPMT1 | 8 |
| AXIF | 1 | CTRASC | 2 | TEMPMX1 | 8 |
| CELAS1 | 1 | CTRIAL | 2 | AXISYM | 9 |
| CELAS2 | 1 | CTRIA2 | 2 | CRIGD1 | 9 |
| CELAS3 | 1 | CTRIAAX | 2 | CRIGD2 | 9 |
| CELAS4 | 1 | CTRIARG | 2 | MPC | 9 |
| CMASS1 | 1 | CTRIATS | 2 | MPCADD | 9 |
| CMASS2 | 1 | CTRHEH | 2 | MPC1 | 9 |
| CMASS3 | 1 | CTRPLT | 2 | MPCAX | 9 |
| CMASS4 | 1 | CTUBE | 2 | SPC | 10 |
| COROLC | 1 | CTWIST | 2 | SPC1 | 10 |
| COROLR | 1 | CWEDGE | 2 | SPCADD | 10 |
| COROL5 | 1 | PBAR | 3 | SPCAX | 10 |
| COROL2C | 1 | PCONEAX | 3 | SPC1 | 10 |
| COROL2R | 1 | PDUH1 | 3 | ASET | 11 |
| COROL2S | 1 | PDUH2 | 3 | ASET1 | 11 |
| GROSET | 1 | PDUH3 | 3 | OMIT | 11 |
| GRID | 1 | PDUH4 | 3 | OMIT1 | 11 |
| GRIDB | 1 | PDUH5 | 3 | OMITAX | 11 |
| POINTAX | 1 | PDUH6 | 3 | SUPAX | 12 |
| RINGAX | 1 | PDUH7 | 3 | SUPORT | 12 |
| RINGFL | 1 | PDUH8 | 3 | TEMP | 13 |
| SECTAX | 1 | PDUH9 | 3 | TEMPAX | 13 |
| SEOGP | 1 | PIHEX | 3 | TEMPO | 13 |
| SPOINT | 1 | PQDHEN | 3 | TEMPP1 | 13 |
| BAROR | 2 | PQDPLT | 3 | TEMPP2 | 13 |
| CBAR | 2 | PQUAD1 | 3 | TEMPP3 | 13 |
| CCONEAX | 2 | PQUAD2 | 3 | TEMPRB | 13 |
| CDUM1 | 2 | PQUADTS | 3 | GRODNT | 15 |
| CDUM2 | 2 | PROD | 3 | PLOT1 | 16 |
| CDUM3 | 2 | PSHEAR | 3 | PLOT1 | 18 |
| CDUM4 | 2 | PTORDRG | 3 | POUT1 | 19 |
| CDUM5 | 2 | PTRAPAX | 3 | XYOUT1 | 20 |
| CDUM6 | 2 | PTRASC | 3 | AOUT1 | 21 |
| CDUM7 | 2 | PTRIA1 | 3 | COUPHASS | 24 |
| CDUM8 | 2 | PTRIA2 | 3 | CPBAR | 24 |
| CDUM9 | 2 | PTRIAAX | 3 | CPDPLT | 24 |
| CFLUID2 | 2 | PTRIATS | 3 | CPQUAD1 | 24 |
| CFLUID3 | 2 | PTRHEH | 3 | CPQUAD2 | 24 |
| CFLUID4 | 2 | PTRPLT | 3 | CPROD | 24 |
| CHEX1 | 2 | PTUBE | 3 | CPTRBSC | 24 |
| CHEX2 | 2 | PTWIST | 3 | CPTRIA1 | 24 |
| CIHEX1 | 2 | GENCL | 4 | CPTRIA2 | 24 |
| CIHEX2 | 2 | CONM1 | 5 | CPTRPLT | 24 |
| CIHEX3 | 2 | CONM2 | 5 | CPTUBE | 24 |
| CONROD | 2 | PELAS | 6 | WTHASS | 24 |
| CQDMEM | 2 | PPASS | 7 | NDDJE | 26 |
| | | MAT1 | 8 | PAEROL | 29 |

RIGID FORMAT RESTART TABLES

Card Name Bit Pos.

| | |
|-----------|----|
| SET1 | 32 |
| SET2 | 32 |
| SPLINE1 | 32 |
| SPLINE2 | 32 |
| MKAERO1 | 34 |
| MKAERO2 | 34 |
| AEFACT | 35 |
| FLFACT | 36 |
| FLUTTER | 36 |
| AERO | 37 |
| CAERO1 | 37 |
| FMETHOD\$ | 38 |
| VREF | 39 |
| TF | 40 |
| CYJOIN | 41 |
| CTYPE | 41 |
| NSEGS | 41 |
| KINDEX | 41 |
| CYCSEQ | 42 |
| STREAML1 | 42 |
| STREAML2 | 42 |
| IREF | 42 |
| MINMACH | 42 |
| MAXMACH | 42 |
| MTYPE | 42 |
| KGIN | 43 |
| SDAMP\$ | 55 |
| TABDMP1 | 55 |
| EPOINT | 56 |
| SEQEP | 56 |
| B2PP\$ | 57 |
| DMIG | 57 |
| K2PP\$ | 57 |
| M2PP\$ | 57 |
| TF\$ | 57 |
| EIGR | 58 |
| METHOD\$ | 59 |
| EIGC | 60 |
| EIGP | 60 |
| CMETHOD\$ | 61 |
| HFREQ | 62 |
| LFREQ | 62 |
| LMODES | 62 |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

10.22.2 Bit Positions for File Name Restart Table

| <u>File Name</u> | <u>Bit Pos.</u> | <u>File Name</u> | <u>Bit Pos.</u> |
|------------------|-----------------|------------------|-----------------|
| BGPD | 94 | KELM | 121 |
| CSTM | 94 | MDICT | 122 |
| EQEXIN | 94 | MELM | 122 |
| GPDT | 94 | MAA | 123 |
| GPL | 94 | ACPT | 124 |
| SIL | 94 | AERO | 124 |
| ECT | 95 | BGPA | 124 |
| GPTT | 96 | CSTNA | 124 |
| EST | 97 | ECTA | 124 |
| GEI | 97 | EQAERO | 124 |
| GPECT | 97 | FLIST | 124 |
| GPST | 98 | GPLA | 124 |
| KGGX | 98 | SILA | 124 |
| MGG | 99 | SILGA | 124 |
| KGG | 100 | SPLINE | 124 |
| RG | 101 | USETA | 124 |
| USET | 101 | ELSETSA | 125 |
| OGPST | 102 | GPSETSA | 125 |
| GM | 103 | PLTPARA | 125 |
| KNN | 104 | PLTSETA | 125 |
| MNN | 104 | GTKA | 126 |
| KFF | 105 | AJJL | 127 |
| KFS | 105 | D1JK | 127 |
| NFF | 105 | D2JK | 127 |
| KAA | 106 | SKJ | 127 |
| KLL | 107 | D1JE | 128 |
| KLR | 107 | D2JE | 128 |
| KRR | 107 | BXHH | 129 |
| MLL | 107 | KXHH | 129 |
| MLR | 107 | MXHH | 129 |
| MRR | 107 | FSAVE | 129 |
| LLL | 108 | CASEYY | 130 |
| DM | 109 | CLAMAL | 130 |
| MR | 110 | OVG | 130 |
| EED | 111 | PHIHL | 130 |
| EQDYN | 111 | CLAMAL1 | 131 |
| GPLD | 111 | CPHIH1 | 131 |
| SILD | 111 | CPHIA | 132 |
| TFPOOL | 111 | RP | 132 |
| USETD | 111 | CPHIK | 133 |
| LAMA | 112 | CPHIPS | 134 |
| MI | 112 | CPHIPA | 136 |
| OEIGS | 112 | QPAC | 136 |
| PHIA | 112 | OCPHIPA | 137 |
| GO | 113 | OEFC1 | 137 |
| B2PP | 114 | OESC1 | 137 |
| K2PP | 114 | OQPAC1 | 137 |
| M2PP | 114 | PCPHIPA | 137 |
| GND | 115 | QHHL | 138 |
| GOD | 115 | QJHL | 138 |
| BHH | 116 | B2DD | 139 |
| KHH | 116 | K2DD | 139 |
| MHH | 116 | M2DD | 139 |
| PHIDH | 116 | YCD | 140 |
| CLAMA | 117 | YKK | 141 |
| OCEIGS | 117 | MKK | 141 |
| PHIH | 117 | PHIK | 142 |
| CPHID | 118 | LANK | 142 |
| CPHIP | 120 | PHIG | 143 |
| QPC | 120 | PVECT | 144 |
| KDICT | 122 | PHIAX | 145 |

RIGID FORMAT RESTART TABLES

10.22.3 Card Name Restart Table

| DMAP Inst. | Bit Position | | | | | |
|---------------|--------------|--------|-----|----------|-----------|----------|
| | 1 | 10 | 20 | 30 | 40 | 50 60 |
| BEGIN | 1234567890 | 123456 | 890 | 1234 6 9 | 2 4567890 | 56789012 |
| FILE | 1234567890 | 1234 | 9 | 1234 6 9 | 2 4567890 | 56789012 |
| GP1 | 1 | | | | | |
| SAVE | 1 | | | | | |
| COND | 1 | | | | | |
| CHKPNT | 1 | | | | | |
| \$SS | 6 | | | | | |
| PURGE | | | | 6 | 7 | |
| GP2 | 12 45 | 6 | | | | |
| CHKPNT | 12 45 | 6 | | | | |
| \$SS | 6 | | | | | |
| GP3 | 12 | 3 | | | | |
| CHKPNT | 12 | 3 | | | | |
| \$SS | 6 | | | | | |
| TA1 | 1234567 | 3 | | | | |
| SAVE | 1234567 | 3 | | | | |
| COND | 1234567 | 34 | | | | |
| PURGE | 1234567 | | | | | |
| CHKPNT | 1234567 | 3 | | | | |
| \$SS | 6 | | | | | |
| PARAM | 123 6 8 | 3 | | | | |
| PARAM | 123 5 78 | 34 | 4 | | | |
| PARAM | | | | | 3 | |
| COND | | | | | 3 | |
| PARAM | | | | | 3 | |
| INPUTT1 | | | | | 3 | |
| EQUIV | | | | | 3 | |
| CHKPNT | | | | | 3 | |
| \$SS | 6 | | | | | |
| LABEL | | | | | 3 | |
| EMG | 123 5678 | 34 | 4 | | 3 | |
| SAVE | 123 5678 | 34 | 4 | | 3 | |
| CHKPNT | 123 5678 | 34 | 4 | | 3 | |
| \$SS | 6 | | | | | |
| COND | 123 6 8 | 3 | | | 3 | |
| EMA | 123 6 8 | 3 | | | 3 | |
| CHKPNT | 123 6 8 | 3 | | | 3 | |
| \$SS | 6 | | | | | |
| LABEL | 123 6 8 | 3 | | | 3 | |
| COND | 123 5 78 | 34 | 4 | | | |
| EMA | 123 5 78 | 34 | 4 | | | |
| CHKPNT | 123 5 78 | 34 | 4 | | | |
| \$SS | 6 | | | | | |
| COND | 123 5 78 | 345 | 4 | | | |
| GPHG | 123 5 78 | 345 | 4 | | | |
| OFF | 123 5 78 | 345 | 4 | | | |
| LABEL | 123 5 78 | 345 | 4 | | | |
| EQUIV | 1234 6 8 | 3 | | | 3 | |
| CHKPNT | 1234 6 8 | 3 | | | 3 | |
| \$SS | 6 | | | | | |
| COND | 1234 6 8 | 3 | | | 3 | |

COMPRESSION BLADE CYCLIC MODAL FLUTTER ANALYSES

| DMAP | Bit Position | | | | | | | | | |
|--------|--------------|--------|------|----|----|----|-------|--|--|--|
| Inst. | 1 | 10 | 20 | 30 | 40 | 50 | 60 | | | |
| SMA3 | 1234 | 6 8 | 3 | | | 3 | | | | |
| CHKPNT | 1234 | 6 8 | 3 | | | 3 | | | | |
| \$SS | | 6 | | | | | | | | |
| LABEL | 1234 | 6 8 | 3 | | | 3 | | | | |
| GP4 | 1 | | 9012 | | | | | | | |
| SAVE | 1 | | 9012 | | | | | | | |
| PARAM | 1 | | 9012 | | 3 | | | | | |
| COND | 1 | | 9012 | | 3 | | | | | |
| PURGE | 1 | | 9012 | | 3 | | | | | |
| GPCYC | 1 | 901 | | | 1 | | | | | |
| SAVE | 1 | 901 | | | 1 | | | | | |
| CHKPNT | 1 | 901 | | | 1 | | | | | |
| \$SS | | 6 | | | | | | | | |
| COND | 1 | 901 | | | 1 | | | | | |
| COND | 1234 | 6 890 | 3 | | 3 | | | | | |
| GP\$P | 1234 | 6 890 | 3 | | 3 | | | | | |
| SAVE | 1234 | 6 890 | 3 | | 3 | | | | | |
| COND | 1234 | 6 890 | 3 | | 3 | | | | | |
| OFF | 1234 | 6 890 | 3 | | 3 | | | | | |
| LABEL | 1234 | 6 890 | 3 | | 3 | | | | | |
| EQUIV | 123456789 | | 4 | 4 | 3 | | | | | |
| CHKPNT | 123456789 | | 4 | 4 | 3 | | | | | |
| \$SS | | 6 | | | | | | | | |
| COND | 123456789 | 34 | 4 | | 3 | | | | | |
| MCE1 | 1 | 9 | 3 | | 3 | | | | | |
| CHKPNT | 1 | 9 | 3 | | 3 | | | | | |
| \$SS | | 6 | | | | | | | | |
| MCE2 | 123456789 | 34 | 4 | | 3 | | | | | |
| CHKPNT | 123456789 | 34 | 4 | | 3 | | | | | |
| \$SS | | 6 | | | | | | | | |
| LABEL | 123456789 | 34 | 4 | | 3 | | | | | |
| EQUIV | 1234567890 | 34 | 4 | | 3 | | | | | |
| CHKPNT | 1234567890 | 34 | 4 | | 3 | | | | | |
| \$SS | | 6 | | | | | | | | |
| COND | 1234567890 | 34 | 4 | | 3 | | | | | |
| SCE1 | 1234567890 | 34 | 4 | | 3 | | | | | |
| CHKPNT | 1234567890 | 34 | 4 | | 3 | | | | | |
| \$SS | | 6 | | | | | | | | |
| LABEL | 1234567890 | 34 | 4 | | 3 | | | | | |
| EQUIV | 12345678901 | 34 | 4 | | 3 | | | | | |
| CHKPNT | 12345678901 | 34 | 4 | | 3 | | | | | |
| \$SS | | 6 | | | | | | | | |
| COND | 12345678901 | 34 | 4 | | 3 | | | | | |
| SMP1 | 1234 | 6 8901 | 3 | | 3 | | | | | |
| CHKPNT | 1234 | 6 8901 | 3 | | 3 | | | | | |
| \$SS | | 6 | | | | | | | | |
| SMP2 | 12345678901 | 34 | 4 | | | | | | | |
| CHKPNT | 12345678901 | 34 | 4 | | | | | | | |
| \$SS | | 6 | | | | | | | | |
| LABEL | 12345678901 | 34 | 4 | | | | | | | |
| OPD | 1 | 9012 | | | 0 | | 6 8 0 | | | |

RIGID FORMAT RESTART TABLES

| DMAP Inst. | 1 | 10 | 20 | Bit Position 30 | 40 | 50 | 60 |
|---------------|----------------|--------|-----|--------------------|------|-------|-------|
| SAVE | 1 | 9012 | | | 0 | | 6 8 0 |
| COND | 1 | 9012 | | | 0 | | 6 8 0 |
| EQUIV | 1234567 | 9012 4 | 234 | | | | 6 8 |
| CYCT2 | 12345678901 | | | | 1 3 | | 8 |
| SAVE | 12345678901 | | | | 1 3 | | 8 |
| CHKPNT | 12345678901 | | | | 1 3 | | 8 |
| \$SS | 6 | | | | | | |
| COND | 12345678901 | | | | 1 3 | | |
| READ | 12345678901234 | | 4 | | 1 3 | | 89 |
| SAVE | 12345678901234 | | 4 | | 1 3 | | 89 |
| CHKPNT | 12345678901234 | | 4 | | 1 3 | | 89 |
| \$SS | 6 | | | | | | |
| PARAM | 12345678901234 | | 4 | | 1 3 | | 89 |
| OFF | 12345678901234 | | 4 | | 1 3 | | 89 |
| SAVE | 12345678901234 | | 4 | | 1 3 | | 89 |
| COND | 12345678901234 | | 4 | | 1 3 | | 89 |
| CYCT2 | 12345678901 | | 4 | | 1 3 | | 89 |
| SAVE | 12345678901 | | 4 | | 1 3 | | 89 |
| CHKPNT | 12345678901 | | 4 | | 1 3 | | 89 |
| \$SS | 6 | | | | | | |
| COND | 12345678901 | | 4 | | 1 3 | | 89 |
| SDR 1 | 12345678901 | | 4 | | 1 3 | | 89 |
| SDR 2 | | | 89 | | | | |
| OFF | | | 9 | | | | |
| SAVE | | | 9 | | | | |
| APDR | 12 | 9012 | | 4567 | 123 | | |
| SAVE | 12 | 9012 | | 4567 | 123 | | |
| CHKPNT | 12 | 9012 | | 4567 | 123 | | |
| \$SS | 6 | | | | | | |
| PARTN | 12 | 9012 | | 4567 | 123 | | |
| SMPYAD | 12 | 9012 | | 4567 | 123 | | |
| MTRXIN | 1 | | 23 | | 0 | | 67 |
| SAVE | 1 | | 23 | | 0 | | 67 |
| PURGE | 12 4 | | 23 | | 0 | | 67 |
| EQUIV | 12 4 | 9 1 | 23 | | 0 | | 67 |
| CHKPNT | 12 4 | 9 1 | 23 | | 0 | | 67 |
| \$SS | 6 | | | | | | |
| GKAD | 1234 6 8901 34 | | 23 | | 0123 | | 67 |
| CHKPNT | 1234 6 8901 34 | | 23 | | 0123 | | 67 |
| \$SS | 6 | | | | | | |
| GKAM | 12345678901234 | | 234 | | 0123 | 56789 | 2 |
| SAVE | 12345678901234 | | 234 | | 0123 | 56789 | 2 |
| CHKPNT | 12345678901234 | | 234 | | 0123 | 56789 | 2 |
| \$SS | 6 | | | | | | |
| PARAML | | | 8 | | | | |
| \$SS | 7 | | | | | | |
| PURGE | | | 8 | | | | |
| \$SS | 7 | | | | | | |
| COND | | | 8 | | | | |
| \$SS | 7 | | | | | | |
| PLTSET | | | 8 | | | | |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

| DAMP | Bit Position | | | | | | | | | |
|--------|---------------|------|-------|--------------|------|----|----------|--|--|--|
| Inst. | 1 | 10 | 20 | 30 | 40 | 50 | 60 | | | |
| \$SS | | 7 | | | | | | | | |
| SAVE | | | 8 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| PRTMSG | | | 8 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| PARAM | | | 8 0 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| PARAM | | | 8 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| COND | | | 8 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| PLOT | | | 8 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| SAVE | | | 8 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| PRTMSG | | | 8 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| LABEL | | | 8 | | | | | | | |
| \$SS | | 7 | | | | | | | | |
| COND | 1 | 9012 | | | 0 | | 6 8 0 | | | |
| PARAM | 1 | | | 9 | 5 7 | | | | | |
| AMG | 1 | | | 9 | 45 7 | 23 | | | | |
| SAVE | 1 | | | 9 | 45 7 | 23 | | | | |
| CHKPNT | 1 | | | 9 | 45 7 | 23 | | | | |
| \$SS | | 6 | | | | | | | | |
| COND | | | 6 | | 7 | | | | | |
| INPUT2 | | | 6 | | 7 | | | | | |
| LABEL | | | 6 | | 7 | | | | | |
| PARAM | 1234567890123 | | 4 6 9 | 2 5 7 | 123 | | 6 89 2 | | | |
| AMP | 1234567890123 | | 4 6 9 | 2 5 7 | 123 | | 6 89 2 | | | |
| SAVE | 1234567890123 | | 4 6 9 | 2 5 7 | 123 | | 6 89 2 | | | |
| CHKPNT | 1234567890123 | | 4 6 9 | 2 5 7 | 123 | | 6 89 2 | | | |
| \$SS | | 6 | | | | | | | | |
| PARAM | | | 0 | | | | | | | |
| PARAM | | | 8 | | | | | | | |
| PARAM | | | 1 | | | | | | | |
| PARAM | 1234567890123 | | 4 6 9 | 2 4567890 | | | 56789012 | | | |
| JUMP | 1234567890123 | | 4 6 9 | 2 4567890 | | | 56789012 | | | |
| LABEL | 1234567890123 | | 4 6 9 | 2 4567890 | | | 56789012 | | | |
| FA1 | 1234567890123 | | 4 6 9 | 2 4567890123 | | | 56789012 | | | |
| SAVE | 1234567890123 | | 4 6 9 | 2 4567890123 | | | 56789012 | | | |
| CFAD | 1234567890123 | | 4 6 9 | 2 4567890123 | | | 56789012 | | | |
| SAVE | 1234567890123 | | 4 6 9 | 2 4567890123 | | | 56789012 | | | |
| COND | 1234567890123 | | 4 6 9 | 2 4567890123 | | | 56789012 | | | |
| COND | | | 1 | | | | | | | |
| VDR | | | 1 | | | | | | | |
| SAVE | | | 1 | | | | | | | |
| COND | | | 1 | | | | | | | |
| DFP | | | 1 | | | | | | | |
| SAVE | | | 1 | | | | | | | |
| LABEL | | | 1 | | | | | | | |

RIGID FORMAT RESTART TABLES

| DMAP Inst. | Bit Position | | | | | |
|---------------|------------------------------|----|---------|--------------|----|----------|
| | 1 | 10 | 20 | 30 | 40 | 50 |
| FA2 | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| SAVE | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| CHKPNT | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| \$\$\$ | 6 | | | | | |
| COND | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| LABEL | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| COND | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| REPT | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| JUMP | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| LABEL | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| CHKPNT | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| \$\$\$ | 6 | | | | | |
| PARAM | | | 0 | | | |
| COND | | | 0 | | | |
| XYTRAM | | | 0 | | | |
| SAVE | | | 0 | | | |
| XYPLOT | | | 0 | | | |
| LABEL | | | 0 | | | |
| PARAM | 1234567890123 | | 1 4 6 9 | 2 4567890123 | | 56789012 |
| COND | 1234567890123 | | 1 4 6 9 | 2 4567890123 | | 56789012 |
| MODACC | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| DDR1 | 1234567890123 | | 4 6 9 | 2 4 67890123 | | 56789012 |
| CHKPNT | 1234567890123 | | 4 6 9 | 2 4 67890123 | | 56789012 |
| \$\$\$ | 6 | | | | | |
| EQUIV | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| COND | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| SDR1 | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| LABEL | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| CHKPNT | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| \$\$\$ | 6 | | | | | |
| EQUIV | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| COND | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| VEC | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| PARTN | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| LABEL | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| SDR2 | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| CHKPNT | 1234567890123 | | 4 6 9 | 2 4567890123 | | 56789012 |
| \$\$\$ | 6 | | | | | |
| OFF | | | 9 | | | |
| COND | | | 8 | | | |
| \$\$\$ | 7 | | | | | |
| PLOT | | | 8 | | | |
| \$\$\$ | 7 | | | | | |
| PRTMSG | | | 8 | | | |
| \$\$\$ | 7 | | | | | |
| LABEL | | | 8 | | | |
| \$\$\$ | 7 | | | | | |
| JUMP | 1234567890123456 8901234 6 9 | | | 2 4567890123 | | 56789012 |
| LABEL | 1234567890123456 8901234 6 9 | | | 2 4567890123 | | 56789012 |
| PRTPARM | 1234567890123456 8901234 6 9 | | | 2 4567890123 | | 56789012 |
| LABEL | 1234567890123456 8901234 6 9 | | | 2 4567890123 | | 56789012 |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

| DMAP Inst. | Bit Position | | | | | | | | | | | |
|---------------|--------------|--------|---------|----|----|----|---------|-----|--|--|--|----------|
| | 1 | 10 | 20 | 30 | 40 | 50 | 60 | | | | | |
| PRTPARM | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| LABEL | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| PRTPARM | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| LABEL | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| PRTPARM | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| LABEL | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| PRTPARM | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| LABEL | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| PRTPARM | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| LABEL | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |
| END | 1234567890 | 123456 | 8901234 | 6 | 9 | 2 | 4567890 | 123 | | | | 56789012 |

RIGID FORMAT RESTART TABLES

10.22.4 Rigid Format Change Restart Table

| DMAP Inst. | <u>Bit Position</u> | |
|---------------|---------------------|-------|
| | 63 | 70 80 |
| BEGIN | 345678901234567 | 345 |
| FILE | 345678901234567 | 345 |
| GP 1 | | |
| SAVE | | |
| COND | 345678901234567 | 345 |
| CHKPNT | | |
| PURGE | | |
| GP 2 | | |
| CHKPNT | | |
| GP 3 | | |
| CHKPNT | | |
| TA 1 | | |
| SAVE | | |
| COND | 345678901234567 | 345 |
| PURGE | | |
| CHKPNT | | |
| PARAM | | |
| PARAM | 3 678 | |
| PARAM | | |
| COND | | |
| PARAM | | |
| INPUTT1 | | |
| EQUIV | | |
| CHKPNT | | |
| LABEL | | |
| EMG | 3 678 | |
| SAVE | 3 678 | |
| CHKPNT | 3 678 | |
| COND | | |
| EMA | | |
| CHKPNT | | |
| LABEL | | |
| COND | 3 678 | |
| EMA | 3 678 | |
| CHKPNT | 3 678 | |
| COND | | |
| GPWG | | |
| DFP | | |
| LABEL | | |
| EQUIV | | |
| CHKPNT | | |
| COND | | |
| SMA 3 | | |
| CHKPNT | | |
| LABEL | | |
| GP 4 | | |
| SAVE | | |
| PARAM | | |
| COND | | |
| PURGE | | |
| GPCYC | | |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

| DMAP Inst. | 63 | Bit Position 70 | 80 |
|---------------|-----------------|--------------------|-----|
| SAVE | | | |
| CHKPNT | | | |
| COND | | | |
| COND | | | |
| GPSP | | | |
| SAVE | | | |
| COND | | | |
| QFP | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| MCE1 | | | |
| CHKPNT | | | |
| MCF2 | | | |
| CHKPNT | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| SCF1 | | | |
| CHKPNT | | | |
| LABEL | | | |
| EQUIV | | | |
| CHKPNT | | | |
| COND | | | |
| SMP1 | | | |
| CHKPNT | | | |
| SMP2 | | | |
| CHKPNT | | | |
| LABEL | | | |
| DPD | | | |
| SAVE | | | |
| COND | 345678901234567 | | 345 |
| EQUIV | | | |
| CYCT2 | | | |
| SAVE | | | |
| CHKPNT | | | |
| COND | | | |
| READ | | | |
| SAVE | | | |
| CHKPNT | | | |
| PARAM | | | |
| QFP | | | |
| SAVE | | | |
| COND | 345678901234567 | | 345 |
| CYCT2 | | | |
| SAVE | | | |
| CHKPNT | | | |
| COND | | | |
| SOR1 | | | |

RIGID FORMAT RESTART TABLES

| DMAP | | Bit Position | |
|---------|-----------------|--------------|-----|
| Inst. | 63 | 70 | 80 |
| SDR 2 | | | |
| OFP | | | |
| SAVE | | | |
| APDB | | | |
| SAVE | | | |
| CHKPNT | | | |
| PARTN | | | |
| SMPYAD | | | |
| MTRXIN | | | |
| SAVE | | | |
| PURGE | | | |
| EQUIV | | | |
| CHKPNT | | | |
| GKAD | | | |
| CHKPNT | | | |
| GKAM | 3 | 234 | |
| SAVF | 3 | 234 | |
| CHKPNT | 3 | 234 | |
| PARAML | | | |
| PURGE | | | |
| COND | | | |
| PLTSET | | | |
| SAVE | | | |
| PRMSG | | | |
| PARAM | | | |
| PARAM | | | |
| COND | | | |
| PLOT | | | |
| SAVE | | | |
| PRMSG | | | |
| LABEL | | | |
| COND | | | |
| PARAM | 345678901234567 | | 345 |
| AMG | | | |
| SAVE | | | |
| CHKPNT | | | |
| COND | | | |
| INPUTT2 | | | |
| LABEL | | | |
| PARAM | | | |
| AMP | | | |
| SAVE | | | |
| CHKPNT | | | |
| PARAM | | | |
| PARAM | | | |
| PARAM | 345678901234567 | | 345 |
| PARAM | 345678901234567 | | 345 |
| JUMP | 345678901234567 | | 345 |
| LABEL | 345678901234567 | | 345 |
| FAI | | | |
| SAVE | | | |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

| DMAP | Inst. | 63 | <u>Bit Position</u> | 70 | 80 |
|---------|-------|-----------------|---------------------|-----|----|
| CEAD | | | | | |
| SAVE | | | | | |
| COND | | | | | |
| COND | | | | | |
| VDR | | | | | |
| SAVE | | | | | |
| COND | | | | | |
| OFF | | | | | |
| SAVE | | | | | |
| LABEL | | | | | |
| FA2 | | | | | |
| SAVE | | | | | |
| CHKPNT | | | | | |
| COND | | 345678901234567 | | 345 | |
| LABEL | | 345678901234567 | | 345 | |
| COND | | 345678901234567 | | 345 | |
| REPT | | 345678901234567 | | 345 | |
| JUMP | | 345678901234567 | | 345 | |
| LABEL | | 345678901234567 | | 345 | |
| CHKPNT | | 345678901234567 | | 345 | |
| PARAML | | | | | |
| COND | | | | | |
| XYTRAN | | | | | |
| SAVE | | | | | |
| XYPLOT | | | | | |
| LABEL | | | | | |
| PARAM | | | | | |
| COND | | | | | |
| MODACC | | | | | |
| DDR1 | | | | | |
| CHKPNT | | | | | |
| EQUIV | | | | | |
| COND | | | | | |
| SDR1 | | | | | |
| LABEL | | | | | |
| CHKPNT | | | | | |
| EQUIV | | | | | |
| COND | | | | | |
| VEC | | | | | |
| PARTN | | | | | |
| LABEL | | | | | |
| SDR2 | | | | | |
| CHKPNT | | | | | |
| OFF | | | | | |
| COND | | | | | |
| PLOT | | | | | |
| PRTMSG | | | | | |
| LABEL | | | | | |
| JUMP | | 345678901234567 | | 345 | |
| LABEL | | 345678901234567 | | 345 | |
| PRTPARM | | 345678901234567 | | 345 | |

RIGID FORMAT RESTART TABLES

| DMAP Inst. | <u>Bit Position</u> | |
|---------------|---------------------|-------|
| | 63 | 70 80 |
| LABEL | 345678901234567 | 345 |
| PRTPARM | 345678901234567 | 345 |
| LABEL | 345678901234567 | 345 |
| PRTPARM | 345678901234567 | 345 |
| LABEL | 345678901234567 | 345 |
| PRTPARM | 345678901234567 | 345 |
| LABEL | 345678901234567 | 345 |
| PRTPARM | 345678901234567 | 345 |
| LABEL | 345678901234567 | 345 |
| PRTPARM | 345678901234567 | 345 |
| LABEL | 345678901234567 | 345 |
| END | 345678901234567 | 345 |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

10.22.5 File Name Restart Table

| DMAP Inst. | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|---------------|----|-----|--------------|-----|-----|-----|-----|
| | | | 110 | 120 | | | |
| BEGIN | | | | | | | |
| FILE | | | | | | | |
| GP1 | 4 | | | | | | |
| SAVE | 4 | | | | | | |
| COND | 4 | | | | | | |
| CHKPNT | 4 | | | | | | |
| PURGE | | | | | 8 | | |
| GP2 | 5 | | | | | | |
| CHKPNT | 5 | | | | | | |
| GP3 | 6 | | | | | | |
| CHKPNT | 6 | | | | | | |
| TA1 | 7 | | | | | | |
| SAVE | 7 | | | | | | |
| COND | 7 | | | | | | |
| PURGE | 7 | 2 | | | | | |
| CHKPNT | 7 | 2 | | | | | |
| PARAM | 8 | | | | | | |
| PARAM | 9 | | | | | | |
| PARAM | 8 | | | | | | |
| COND | 8 | | | | | | |
| PARAM | 8 | | | | | | |
| INPUTT1 | 8 | | | | | | |
| EQUIV | 8 | | | | | | |
| CHKPNT | 8 | | | | | | |
| LABEL | | | | | | | |
| EMG | | | | 2 | | | |
| SAVE | | | | 2 | | | |
| CHKPNT | | | | 2 | | | |
| COND | 8 | | | | | | |
| EMA | 8 | | | | | | |
| CHKPNT | 8 | | | | | | |
| LABEL | 8 | | | | | | |
| COND | 9 | | | | | | |
| EMA | 9 | | | | | | |
| CHKPNT | 9 | | | | | | |
| COND | | | | | | | |
| GPWG | | | | | | | |
| OFF | | | | | | | |
| LABEL | | | | | | | |
| EQUIV | 0 | | | | | | |
| CHKPNT | 0 | | | | | | |
| COND | 0 | | | | | | |
| SMA3 | 0 | | | | | | |
| CHKPNT | 0 | | | | | | |
| LABEL | 0 | | | | | | |
| GP4 | 1 | | | | | | |
| SAVE | 1 | | | | | | |
| PARAM | 1 | | | | | | |
| COND | | | | | | | |
| PURGE | | 3 | 5 | 0 | | | |
| GPCYC | | | | | | 0 | |

RIGID FORMAT RESTART TABLES

| DMAP Inst. | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|---------------|----|-----|--------------|-----|-----|-----|-----|
| | | | 110 | 120 | | | |
| SAVE | | | | | | 0 | |
| CHKPNT | | | | | | 0 | |
| COND | | | | | | 0 | |
| COND | | 2 | | | | | |
| GPSP | | 2 | | | | | |
| SAVE | | 2 | | | | | |
| COND | | 2 | | | | | |
| OFF | | 2 | | | | | |
| LABEL | | 2 | | | | | |
| EQUIV | | 4 | | | | | |
| CHKPNT | | 4 | | | | | |
| COND | | 34 | | | | | |
| MCE1 | | 3 | | | | | |
| CHKPNT | | 3 | | | | | |
| MCE2 | | 4 | | | | | |
| CHKPNT | | 4 | | | | | |
| LABEL | | 34 | | | | | |
| EQUIV | | 5 | | | | | |
| CHKPNT | | 5 | | | | | |
| COND | | 5 | | | | | |
| SCF1 | | 5 | | | | | |
| CHKPNT | | 5 | | | | | |
| LABEL | | 5 | | | | | |
| EQUIV | | 6 | | | 3 | | |
| CHKPNT | | 6 | | | 3 | | |
| COND | | 6 | 3 | | 3 | | |
| SMP1 | | 6 | 3 | | | | |
| CHKPNT | | 6 | 3 | | | | |
| SMP2 | | | | | 3 | | |
| CHKPNT | | | | | 3 | | |
| LABEL | | 6 | 3 | | 3 | | |
| DPD | | | 1 | | | | |
| SAVE | | | | | | | |
| COND | | | | | | | |
| EQUIV | | | | 5 | | | |
| CYCT2 | | | | | | 1 | |
| SAVE | | | | | | 1 | |
| CHKPNT | | | | | | 1 | |
| COND | | | | | | 1 | |
| READ | | | 2 | | | 2 | |
| SAVE | | | 2 | | | 2 | |
| CHKPNT | | | 2 | | | 2 | |
| PARAM | | | 2 | | | 2 | |
| OFF | | | 2 | | | 2 | |
| SAVE | | | 2 | | | 2 | |
| COND | | | 2 | | | 2 | |
| CYCT2 | | | 2 | | | | |
| SAVE | | | 2 | | | | |
| CHKPNT | | | 2 | | | | |
| COND | | | 2 | | | | |
| SOR1 | | | 3 | | | | |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

| DMAP | Inst. | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|---------|-------|----|-----|--------------|-----|-----|-----|-----|
| | | | | 110 | 120 | | | |
| SC2 | | | | | | | | |
| OFF | | | | | | | | |
| SAVE | | | | | | | | |
| APOB | | | | | 4 6 | | | 4 |
| SAVE | | | | | 4 6 | | | 4 |
| CHKPNT | | | | | 4 6 | | | 4 |
| PARTN | | | | | | | | 5 |
| SMYAO | | | 2 | | | | | |
| MTRXIN | | | 4 | | | | | |
| SAVE | | | 4 | | 9 | | | |
| PURGE | | | 4 | | 9 | | | |
| EQUIV | | | 4 | | 9 | | | |
| CHKPNT | | | 4 | | 9 | | | |
| GKAD | | | 5 | | 9 | | | |
| CHKPNT | | | 5 | | 9 | | | |
| GKAM | | | 6 | | | | | |
| SAVE | | | 6 | | | | | |
| CHKPNT | | | 6 | | | | | |
| PARAML | | | | | 5 | | | |
| PURGE | | | | | 4 | | | |
| COND | | | | | 5 | | | |
| PLTSET | | | | | 5 | | | |
| SAVE | | | | | 5 | | | |
| PRTHSG | | | | | 5 | | | |
| PARAM | | | | | 5 | | | |
| PARAM | | | | | 5 | | | |
| COND | | | | | 5 | | | |
| PLOT | | | | | 5 | | | |
| SAVE | | | | | | | | |
| PRTHSG | | | | | | | | |
| LABEL | | | | | 5 | | | |
| COND | | | | | | | | |
| PARAM | | | | | | | | |
| AMG | | | | | 7 | | | |
| SAVE | | | | | 7 | | | |
| CHKPNT | | | | | 7 | | | |
| COND | | | | | 8 | | | |
| INPUTT2 | | | | | 8 | | | |
| LABEL | | | | | 8 | | | |
| PARAM | | | | | | 8 | | |
| AMP | | | | | | 8 | | |
| SAVE | | | | | | 8 | | |
| CHKPNT | | | | | | 8 | | |
| PARAM | | | | | | | | |
| PARAM | | | | | | | | |
| PARAM | | | | | | | | |
| JUMP | | | | | | | | |
| LABEL | | | | | | | | |
| FAI | | | | | 9 | | | |
| SAVE | | | | | 9 | | | |

RIGID FORMAT RESTART TABLES

| DMAP | 94 | 100 | Bit Position | | 130 | 140 | 150 |
|---------|----|-----|--------------|-----|-----|-----|-----|
| Inst. | | | 110 | 120 | | | |
| CEAD | | | | | 7 | | |
| SAVE | | | | | 7 | | |
| COND | | | | | 7 | | |
| COND | | | | | | | |
| VDR | | | | | | | |
| SAVE | | | | | | | |
| COND | | | | | | | |
| DFP | | | | | | | |
| SAVE | | | | | | | |
| LABEL | | | | | | | |
| FA2 | | | | 0 | | | |
| SAVE | | | | 0 | | | |
| CHKPNT | | | | 0 | | | |
| COND | | | | | | | |
| LABEL | | | | | | | |
| COND | | | | | | | |
| REPT | | | | | | | |
| JUMP | | | | | | | |
| LABEL | | | | | | | |
| CHKPNT | | | | | | | |
| PARAML | | | | | | | |
| COND | | | | | | | |
| XYTRAN | | | | | | | |
| SAVE | | | | | | | |
| XYPLOT | | | | | | | |
| LABEL | | | | | | | |
| PARAM | | | | | | | |
| COND | | | | | | | |
| MODACC | | | | | 1 | | |
| DDR 1 | | | 8 | | | | |
| CHKPNT | | | 8 | | | | |
| EQUIV | | | | 0 | | | |
| COND | | | | 0 | | | |
| SDR 1 | | | | 0 | | | |
| LABEL | | | | 0 | | | |
| CHKPNT | | | | 0 | | | |
| EQUIV | | | | | 2 | | |
| COND | | | | | 2 | | |
| VEC | | | | | | 2 | |
| PARTN | | | | | | 2 | |
| LABEL | | | | | | 2 | |
| SDR 2 | | | | | | | 7 |
| CHKPNT | | | | | | | 7 |
| DFP | | | | | | | |
| COND | | | | | | | |
| PLOT | | | | | | | |
| PRMSG | | | | | | | |
| LABEL | | | | | | | |
| JUMP | | | | | | | |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

| DMAP | | | Bit Position | | | | |
|---------|----|-----|--------------|-----|-----|-----|-----|
| Inst. | 94 | 100 | 110 | 120 | 130 | 140 | 150 |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |
| LABFL | | | | | | | |
| PRTPARM | | | | | | | |
| LABEL | | | | | | | |
| PRTPARM | | | | | | | |
| LABEL | | | | | | | |
| END | | | | | | | |